QLconfig

Operations Guide

FC0051102-00 A

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Section 1
Introduction

1.1 What is the QLogic Management Suite?

The QLogic Management Suite (QMS) utilities configure and control Storage Area Networks (SANs). The suite is made up of two software utilities: QLconfig and QLview.

- ❑ QLconfig controls the configuration and availability of a SAN. Use this utility to configure storage resources and share storage resources efficiently.
- ❑ QLview provides configuration information, statistics, diagnostics, and alarm notification for a SAN. Use this utility to monitor both the QLA2xxx adapters and the attached storage devices. QLview data can be easily integrated into other network and system management software.

The QLogic Management Suite uses a Graphical User Interface (GUI). The QLA2xxx adapters being controlled are pictured, along with their attributes, making it easy to control the devices either locally or remotely. The QLogic Management Suite works with the following operating systems: Windows NT, Windows 2000, and Novell NetWare. Support of multiple operating systems allows control of heterogeneous environments.

1.2 What is QLconfig?

QLconfig is the utility component of the QLogic Management Suite that controls the configuration and availability of a SAN. QLconfig allows you to configure storage resources, share storage resources efficiently, and provide reliability. If you have the QLconfig High Availability version, you can use the QLconfig utility with the QLdirect driver to control failover.

Even a system as small as one host and two QLA2xxx adapters can benefit from the failover and load balancing aspects of QLconfig. When the SAN expands to include Redundant Array of Independent Disks (RAID) systems and clusters, the masking, hot swapping device replacement, and heterogeneous support features of the QLconfig utility come into play.

QLconfig gives a network-wide view of the total configuration (as contrasted with the server-wide view of a single server and its local storage). Configuration among servers is synchronized to ensure data integrity. In a nonclustering environment,

only one server is allowed access to a storage device. Logical Unit Numbers (LUNs) that are already configured by one server cannot be configured on other servers.

The QLconfig utility contains three software components:

- **QLconfig Agent.** This application is the software that allows you to configure the QLA2xxx adapters, and their attached devices and LUNs. You must install this software on the systems that contain the QLA2xxx adapters. The application includes a copy for Windows NT/Windows 2000 and Novell NetWare.
- **QLconfig Security.** This application allows you to set the password for access to the agent and to enable/disable device and LUN configuration.
- **QLconfig Application.** The QLconfig application provides the GUI that enables you to configure the QLA2xxx adapters. You must install the application on the system where the QLA2xxx adapters reside for local control or on any system on the same network for remote control.

1.3 Features

The QLconfig utility has the following features.

- **Failover Path.** This feature offers an alternate path to a device if the primary path fails.
- **Load Balancing.** The mechanism that assigns primary and failover paths from drives to multiple adapters can also improve performance by balancing the static loading of QLA2xxx adapters by drives.
- **Device Selection and Masking.** This feature assigns the target devices and LUNs to the QLA2xxx adapters connected to one server or assigns LUNs to different servers. Masking is supported at both the target level (configuring or unconfiguring a device) and the LUN level (enabling or disabling a LUN for the adapter).
- **Hot Swapping.** Hot swapping allows you to make changes to the system storage without having to reboot the system. LUNs can be added to extend system capacity. Devices can be hot swapped if one fails.
- **Secure Device Access**. This feature allows single-server control of attached SAN resources. Resources can be re-assigned from one server to another as needed.
- **Heterogeneous Support.** This feature allows operation in a cluster or network with multiple operating system types. The QLconfig utility runs under Windows NT, Windows 2000, and Novell NetWare.

Section 2
Requirements

2.1 Introduction

QLconfig requires the hardware and software listed in this section for optimum performance.

2.2 Hardware Requirements

- ❑ QLogic QLA2xxx Fibre Channel adapter (see section 2.4)
- ❑ Single- or multi-processor server or workstation
- ❑ Pentium class 100 MHz; 64-MB RAM; minimum 20-MB disk space

2.3 Software Requirements

- ❑ Microsoft Windows NT 4.0 Server, Enterprise Server, or Workstation with Service Pack 5 or later
  or
  Windows 2000 Server, Advanced Server, or Professional
- ❑ QLogic QLA2xxx miniport drivers, version 7.5.2 or later
- ❑ QLdirect, version 7.2.5 or later, for QLconfig High Availability version failover on Windows NT or Windows 2000 servers
- ❑ TCP/IP Protocol for Windows NT or Windows 2000 remote management
- ❑ Novell NetWare 4.2, 5.x server (optional)
- ❑ Internetwork Packet eXchange/Sequenced Packet eXchange (IPX/SPX) protocol for Novell NetWare 4.2, 5.x remote management

NOTE: You must have administrative privileges to perform management functions.

2.4
Supported QLA2xxx Adapters

NOTE: The following QLogic adapters are collectively referred to as the *QLA2xxx adapter* unless otherwise noted. QLconfig supports the following QLA2xxx adapters:

- ❑ **QLA2100 family**
  FC0210403-01 (QLA2100/33)
  FC0210403-02 (QLA2100/66)
- ❑ **QLA2100F family**
  FC0310403-01 (QLA2100/33)
  FC0310403-02 (QLA2100/66)
- ❑ **QLA2102F family**
  FC0610402-01 (QLA2102F/33)
- ❑ **QLA2200 family** (64-bit PCI to Fibre Channel copper media):
  FC0210406-03 (ISP2200 chip)
  FC0210406-04 (ISP2200A/33 chip)
  FC0210406-05 (ISP2200A/66 chip)
- ❑ **QLA2200F family** (64-bit PCI to Fibre Channel optical media):
  FC0310406-03 (ISP2200 chip)
  FC0310406-04 (ISP2200A/33 chip)
  FC0310406-05 (ISP2200A/66 chip)
- ❑ **QLA2202F family** (64-bit PCI to dual channel optical media):
  FC0610403-04 (ISP2200A/33 chip)
  FC0610403-05 (ISP2200A/66 chip)
- ❑ **QLA2200G family** (64-bit PCI to Fibre Channel GigaBit Interface Converter [GBIC]) with ISP2200A/66 chip:
  FC3010402-01 (QLA2200G/66; without GBIC)
  FC3010402-01(QLA2200GC/66, with GBIC copper)
  FC3010402-01 (QLA2200GF/66; with GBIC optical)
- ❑ **QLA2200L family** (64-bit, low-profile PCI to Fibre Channel copper media):
  FC0210408-XX (ISP2200A/66 chip)

NOTE: In the chip and adapter names, /33 indicates 33 MHz; /66 indicates 66 MHz.

Section 3
Installing QLconfig

3.1 Introduction

You can install QLconfig by downloading the software from the QLogic web site or by using the QLogic Management Suite (QMS) CD-ROM. After you download the software or insert the CD-ROM, follow the steps listed in section 3.3 to complete the installation.

3.2 Installation Options

QLconfig supports both stand-alone and networked configurations. Install the software appropriate for your configuration (see table 3-1):

Table 3-1. Configuration Option Installation Requirements

Configuration	Software Requirements
Stand-alone	
This system will configure QLA2xxx adapters locally.	QLconfig Application and QLconfig NT/2000 Agent
Networked	
This system will configure QLA2xxx adapters locally and on remote systems on the same network.	QLconfig Application and QLconfig NT/2000 Agent
This system will configure QLA2xxx adapters only on remote systems on the same network.	QLconfig Application
The QLA2xxx adapters on this Windows NT/Windows 2000 system will be remotely configured only from other systems on the same network.	QLconfig NT/2000 Agent
The QLA2xxx adapters on the NetWare server will be remotely configured only from other systems on the same network.	QLconfig NetWare Agent

3.3 NetWare Installation Prerequisites

Make sure the following components are present on the locations listed below before installing the QLconfig NetWare Agent:

- ❑ On the Windows NT/2000 Client:
  - ❑ NetWare Client software (from Novell)
  - ❑ Network protocols:

    NWLink IPX/SPX-compatible transport
    NWLink NetBios
  - ❑ Drive letter mapped to the root of the SYS Volume of the NetWare server. By default, the NetWare Client maps to sys\system or sys\public; however, you must set the root of SYS Volume by assigning a drive letter to sys:\.

  NOTE: You must be logged on as an administrator.
- ❑ On the NetWare Server:
  - ❑ NetWare 5.x server with support pack NW5SP4
    or
    NetWare 4.2 server with support pack NW4SP8a
  - ❑ QL2200.HAM version 5.40s or later
  - ❑ QL2100.HAM version 5.40s or later

3.4 Installation Instructions

QLconfig Setup is a self-extracting program that installs the QLconfig application and related software.

NOTE: QLconfig always overwrites the previous version of QLconfig.

The following steps take you through the installation process:

1. If you have downloaded QLconfig from the Internet, find the QLconfig folder in the location you specified for downloading, then double-click the setup icon for your version of QLconfig.

   NOTE: If you are installing QLconfig from a CD-ROM, refer to the online installation instructions.

   ❑ Standard version. Double-click the **QLconfig Std Setup.exe** icon (see figure 3-1):

Figure 3-1. QLconfig Standard Version Setup Icon

   ❑ High Availability version. Double-click the **QLconfig HA Setup.exe** icon (see figure 3-2):

Figure 3-2. QLconfig High Availability Version Setup Icon

   The *Unpacking QLconfig Setup* dialog displays as the installation process begins (see figure 3-3):

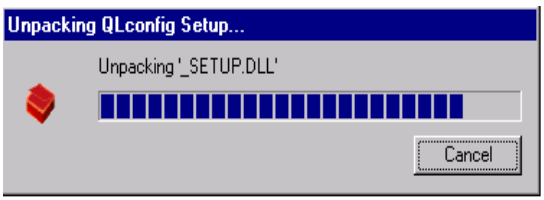

Figure 3-3. Unpacking QLconfig Setup Dialog

If the temporary files from a previous installation of QLconfig have not been deleted by the operating system, the *Overwrite Protection* dialog displays (see figure 3-4):

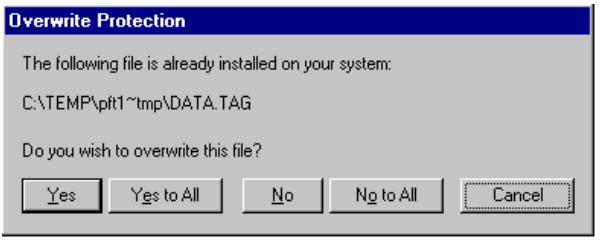

Figure 3-4. Overwrite Protection Dialog

Do the following:

a. Click **Cancel** to abort the installation.

b. Go to the \TEMP directory and delete the pft1~tmp folder.

c. Restart the QLconfig installation.

2. The *Information* window displays (see figure 3-5):

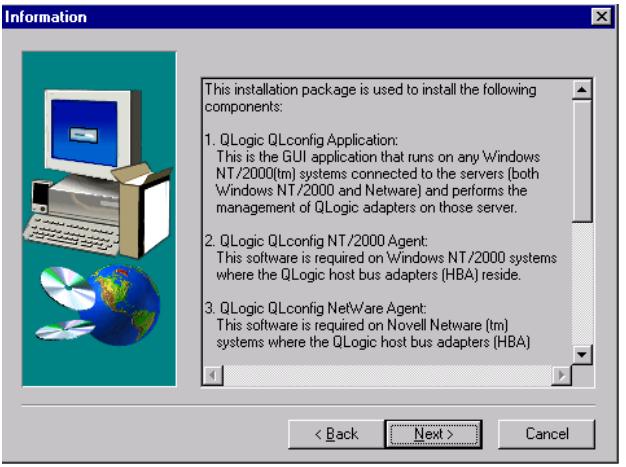
Information
This installation package is used to install the following components:
1. QLogic QLconfig Application:
This is the GUI application that runs on any Windows NT/2000(tm) systems connected to the servers (both Windows NT/2000 and Netware) and performs the management of QLogic adapters on those server.
2. QLogic QLconfig NT/2000 Agent:
This software is required on Windows NT/2000 systems where the QLogic host bus adapters (HBA) reside.
3. QLogic QLconfig NetWare Agent:
This software is required on Novell Netware (tm) systems where the QLogic host bus adapters (HBA)
< Back
Next >
Cancel

Figure 3-5. Information Window

Read the information, then click **Next**.

3. The *Software License Agreement* window displays (see figure 3-6):

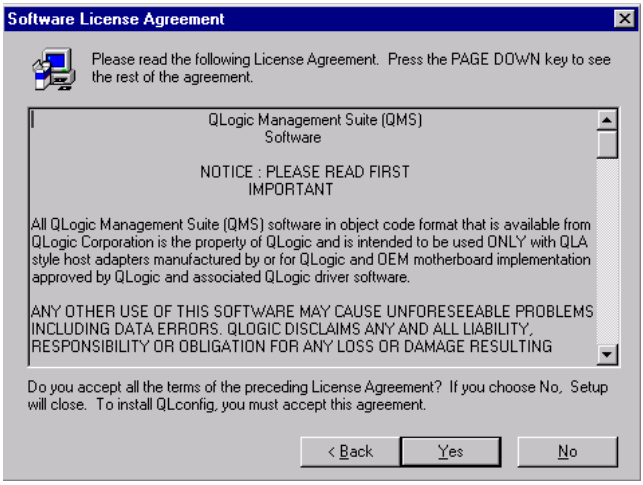
Software License Agreement
Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.
QLogic Management Suite (QMS) Software
NOTICE : PLEASE READ FIRST IMPORTANT
All QLogic Management Suite (QMS) software in object code format that is available from QLogic Corporation is the property of QLogic and is intended to be used ONLY with QLA style host adapters manufactured by or for QLogic and OEM motherboard implementation approved by QLogic and associated QLogic driver software.
ANY OTHER USE OF THIS SOFTWARE MAY CAUSE UNFORESEEABLE PROBLEMS INCLUDING DATA ERRORS. QLOGIC DISCLAIMS ANY AND ALL LIABILITY, RESPONSIBILITY OR OBLIGATION FOR ANY LOSS OR DAMAGE RESULTING
Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install QLconfig, you must accept this agreement.
< Back
Yes
No

Figure 3-6. Software License Agreement Window

Read the agreement, then click **Yes**.

4. The *Choose Destination Location* window displays (see figure 3-7):

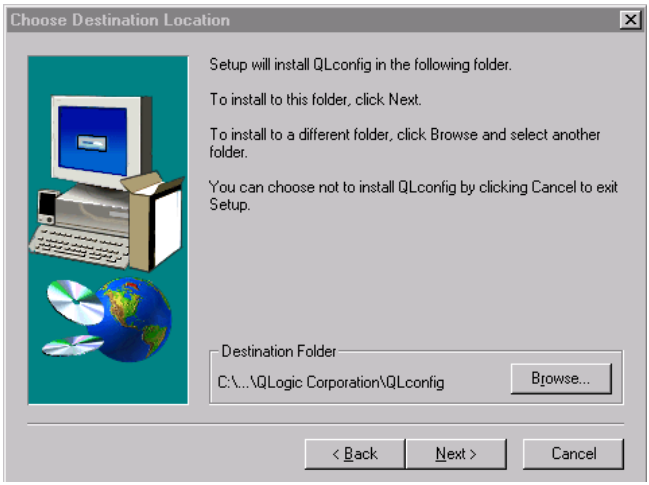
Choose Destination Location
Setup will install QLconfig in the following folder.
To install to this folder, click Next.
To install to a different folder, click Browse and select another folder.
You can choose not to install QLconfig by clicking Cancel to exit Setup.
Destination Folder
C:\...\QLogic Corporation\QLconfig
Browse...
< Back
Next >
Cancel

Figure 3-7. Choose Destination Location Window

Do one of the following:

- ❑ To select the destination location displayed in the window, click **Next** (recommended).

  or

- ❑ To select a different location:

  a. Click **Browse**. The *Choose Folder* dialog displays (see figure 3-8):

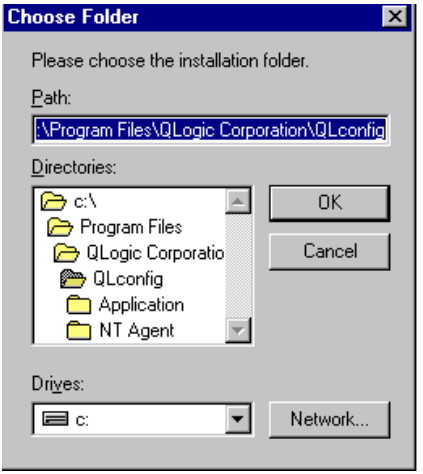

Figure 3-8. Choose Folder Dialog

  b. Select the desired location, then click **OK**.

  c. The *Choose Destination Location* window redisplays. Click **Next**.

5. The *Select Components* window displays (see figure 3-9):

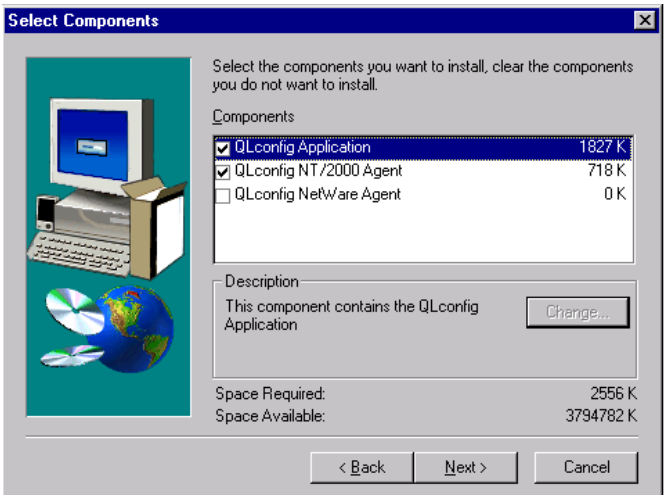
Select Components
Select the components you want to install, clear the components you do not want to install.
Components
QLconfig Application 1827 K
QLconfig NT/2000 Agent 718 K
QLconfig NetWare Agent 0 K
Description
This component contains the QLconfig Application
Change...
Space Required: 2556 K
Space Available: 3794782 K
< Back
Next >
Cancel

Figure 3-9. Select Components Window

a. Do one of the following:

- ❑ Select **QLconfig Application** and **QLconfig NT/2000 Agent** (the default options) if this system will configure QLA2xxx adapters on a stand-alone system.
- ❑ Select **QLconfig Application** and **QLconfig NT/2000 Agent** (the default options) if this system will configure QLA2xxx adapters locally and on remote systems on the same network.
- ❑ Select **QLconfig Application** (a default option) if this system will configure QLA2xxx adapters only on remote systems on the same network.
- ❑ Select **QLconfig NT/2000 Agent** (a default option) if the QLA2xxx adapters on this Windows NT/Windows 2000 system will be remotely configured only from other systems on the same network.
- ❑ Select **QLconfig NetWare Agent** if the QLA2xxx adapters on a NetWare server will be remotely configured only from other systems on the same network.

b. Click **Next**.

6. If a previous version of Intel Desktop Management Interface (DMI) 2.0 Service Provider (SP) exists on the system, the *Installing DMI SP 2.0 for Windows* dialog displays (see figure 3-10):

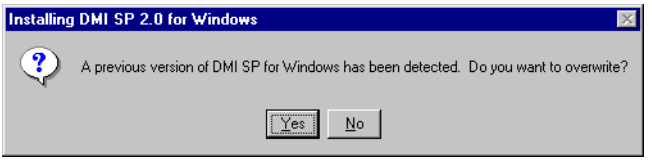
Installing DMI SP 2.0 for Windows
A previous version of DMI SP for Windows has been detected. Do you want to overwrite?
Yes
No

Figure 3-10. Installing DMI SP 2.0 for Windows Dialog

Do one of the following:

- ❑ To overwrite the previous version, click **Yes**.
- ❑ To use the previous version, click **No** (recommended) and proceed with step 15.

7. The Intel DMI 2.0 SP installer is automatically invoked when no other service provider is installed on your system or if you chose to overwrite the previous version in step 6. The DMI SP coordinates activities between management applications and component software, including installing components, serializing and synchronizing requests, and controlling the general flow of system operations.

   All of the QLconfig files for the local system are copied before the Intel DMI 2.0 SP installer is launched. QLconfig always overwrites the previous version of the software.

   The *Setup* dialog tracks the preparation of the InstallShield Wizard (see figure 3-11):

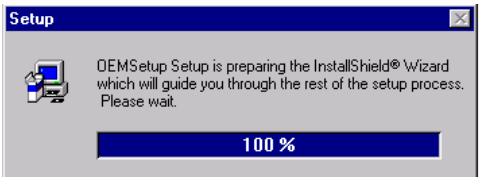
Setup
OEMSetup Setup is preparing the InstallShield® Wizard which will guide you through the rest of the setup process. Please wait.
100 %

Figure 3-11. InstallShield Setup Dialog

The *Intel DMI 2.0 Service Provider (SP) SDK Version 1.10 Installation* window displays (see figure 3-12):

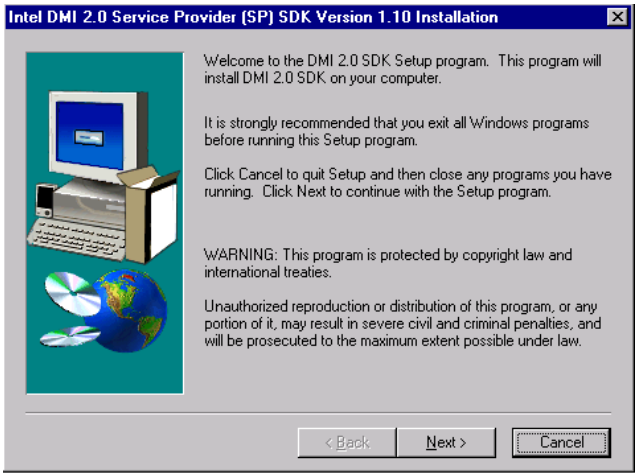
Intel DMI 2.0 Service Provider (SP) SDK Version 1.10 Installation
Welcome to the DMI 2.0 SDK Setup program. This program will install DMI 2.0 SDK on your computer.
It is strongly recommended that you exit all Windows programs before running this Setup program.
Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.
WARNING: This program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
< Back
Next >
Cancel

Figure 3-12. Intel DMI 2.0 Service Provider Installation Window

To invoke DMI SP installation, read the instructions, then click **Next**.

8. The *Software License Agreement* window displays (see figure 3-13):

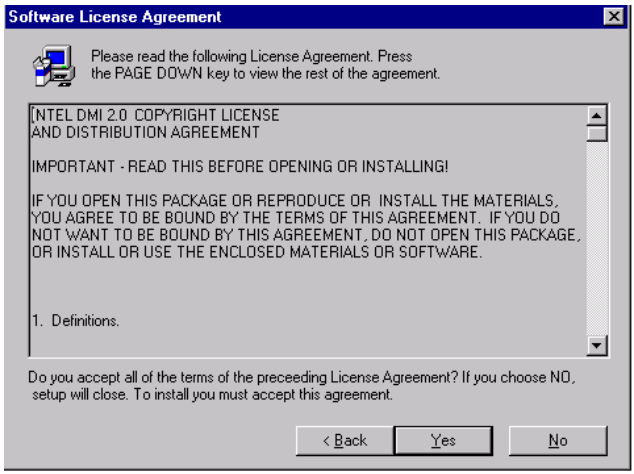
Software License Agreement
Please read the following License Agreement. Press the PAGE DOWN key to view the rest of the agreement.
INTEL DMI 2.0 COPYRIGHT LICENSE
AND DISTRIBUTION AGREEMENT
IMPORTANT - READ THIS BEFORE OPENING OR INSTALLING!
IF YOU OPEN THIS PACKAGE OR REPRODUCE OR INSTALL THE MATERIALS, YOU AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT WANT TO BE BOUND BY THIS AGREEMENT, DO NOT OPEN THIS PACKAGE, OR INSTALL OR USE THE ENCLOSED MATERIALS OR SOFTWARE.
1. Definitions.
Do you accept all of the terms of the preceeding License Agreement? If you choose NO, setup will close. To install you must accept this agreement.
< Back
Yes
No

Figure 3-13. Intel DMI 2.0 Software License Agreement Window

Read the agreement, then click **Yes**.

9. If a previous version of Intel DMI 2.0 SP exists on the system, the following information message displays (see figure 3-14):

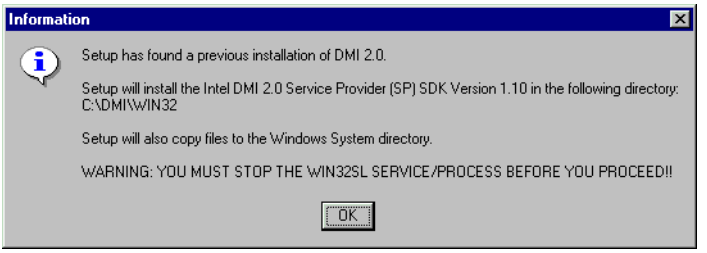
Information
Setup has found a previous installation of DMI 2.0.
Setup will install the Intel DMI 2.0 Service Provider (SP) SDK Version 1.10 in the following directory:
C:\DMI\WIN32
Setup will also copy files to the Windows System directory.
WARNING: YOU MUST STOP THE WIN32SL SERVICE/PROCESS BEFORE YOU PROCEED!!
OK

Figure 3-14. Intel DMI 2.0 Previously Installed Information Message

Click **OK**.

10. The *Installation Components Selection* window displays (see figure 3-15):

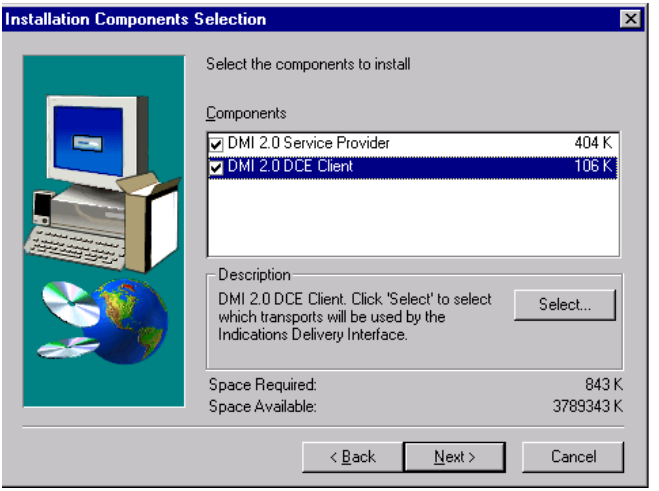
Installation Components Selection
Select the components to install
Components
DMI 2.0 Service Provider 404 K
DMI 2.0 DCE Client 106 K
Description
DMI 2.0 DCE Client. Click 'Select' to select which transports will be used by the Indications Delivery Interface.
Select...
Space Required: 843 K
Space Available: 3789343 K
< Back
Next >
Cancel

Figure 3-15. Intel DMI 2.0 Installation Components Selection Window

In the Components field, select **DMI 2.0 Service Provider** and **DMI 2.0 DCE Client**.

NOTE: You must select both of these components.

Click **Select** to specify the transport sub-components for the Intel DMI 2.0 Client.

11. The *Select Sub-components* dialog displays (see figure 3-16):

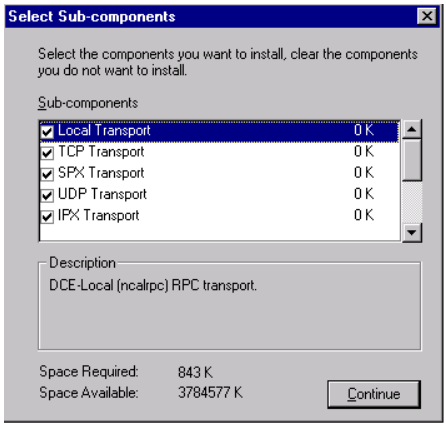
Select Sub-components
Select the components you want to install, clear the components you do not want to install.
Sub-components
Local Transport 0 K
TCP Transport 0 K
SPX Transport 0 K
UDP Transport 0 K
IPX Transport 0 K
Description
DCE-Local (ncalrpc) RPC transport.
Space Required: 843 K
Space Available: 3784577 K
Continue

Figure 3-16. Intel DMI 2.0 Select Sub-components Dialog

Select the transports you wish to install or deselect the transports you do not wish to install, then click **Continue**.

All of the transports are selected by default. You must select the transport types specific to your system configuration, as shown in table 3-2:

Table 3-2. System Configuration Transport Requirements

Configuration	Required Transport Type
Local machine access	Select **Local Transport**.
Windows NT/2000	Select **TCP Transport**.
NetWare 4.2/5.x	Select **SPX Transport** and **IPX Transport**.

UDP Transport is optional in all configurations.

12. The *Installation Components Selection* window redisplays (see figure 3-15). Click **Next**.

13. The *Select Program Folder* window displays (see figure 3-17):

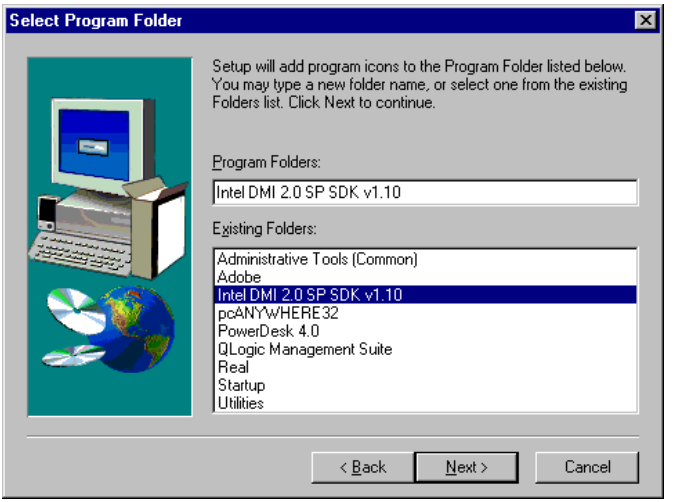
Select Program Folder
Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing Folders list. Click Next to continue.
Program Folders:
Intel DMI 2.0 SP SDK v1.10
Existing Folders:
Administrative Tools (Common)
Adobe
Intel DMI 2.0 SP SDK v1.10
pcANYWHERE32
PowerDesk 4.0
QLogic Management Suite
Real
Startup
Utilities
< Back
Next >
Cancel

Figure 3-17. Intel DMI 2.0 Select Program Folder Window

a. Do one of the following:

- ❑ Select a folder from the Existing Folders field (recommended).

  or

- ❑ In the Program Folders field, type the name of the folder to which you wish the program icons added.

b. Click **Next**.

The *Copying Program Files* dialog tracks the copying process (see figure 3-18):

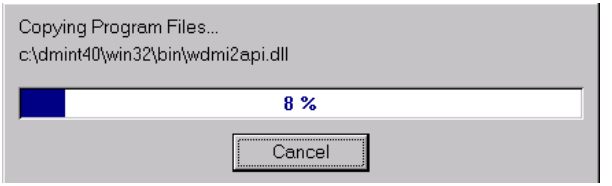

Figure 3-18. Intel DMI 2.0 Copying Program Files Dialog

14. When the Intel DMI files have finished copying on your system, the following information message displays (see figure 3-19):

Figure 3-19. Intel DMI 2.0 Files Finished Coping Information Message

Click **OK**.

15. If there is no QLconfig shortcut on your desktop, the QLconfig *Adding Shortcut* dialog displays (see figure 3-20):

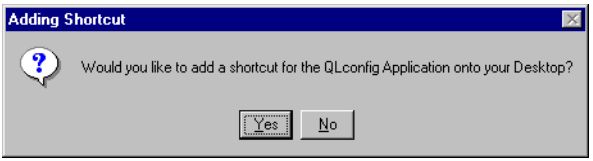

Figure 3-20. QLconfig Adding Shortcut Dialog

Click **Yes** to create a shortcut to QLconfig on your desktop. The **QLconfig** icon displays on your desktop (see figure 3-21):

Figure 3-21. QLconfig Desktop Icon

16. If you selected **QLconfig NetWare Agent** in the *Select Components* window (step 5), the *Choose Destination Location* window displays for NetWare-specific information (see figure 3-22):

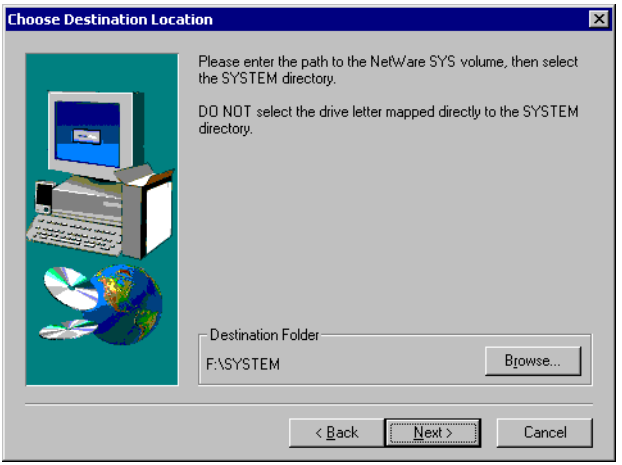
Choose Destination Location
Please enter the path to the NetWare SYS volume, then select the SYSTEM directory.
DO NOT select the drive letter mapped directly to the SYSTEM directory.
Destination Folder
F:\SYSTEM
Browse...
< Back
Next >
Cancel

Figure 3-22. NetWare Choose Destination Location Window

The installer automatically selects the appropriate drive letter and directory of the first NetWare server found in the Windows drive letter mapping. Do one of the following:

❑ Click **Next** to select the destination folder that displays.

or

❑ Select a different destination folder. Do the following:

a. Click **Browse**. The *Choose Folder* dialog displays (see figure 3-23):

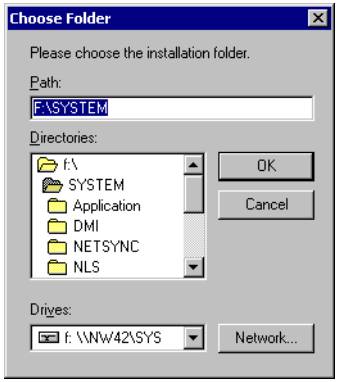

Figure 3-23. Choose Folder Dialog for SYS Volume

b. Specify the drive letter mapped to the root of the SYS Volume, then select the system directory (see section 3.3). The Destination Folder should display *<NetWare mapped drive>:\system*.

c. Click **OK**.

d. The *Choose Destination Location* window redisplays. Click **Next**.

If you did not specify the root of the SYS Volume, the following error dialog displays (see figure 3-24). If this error dialog does not display, proceed with step 17.

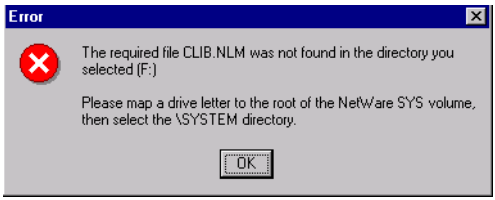
Error
The required file CLIB.NLM was not found in the directory you selected (F:)
Please map a drive letter to the root of the NetWare SYS volume, then select the \SYSTEM directory.
OK

Figure 3-24. NetWare SYS Volume Error Dialog

Click **OK**, the *Choose Destination Location* window redisplays. Do one of the following:

- ❑ To specify the root of SYS Volume and install the NetWare Agent, follow steps a through d.

  or

- ❑ To not install the NetWare Agent, click **Back**. The following question displays:

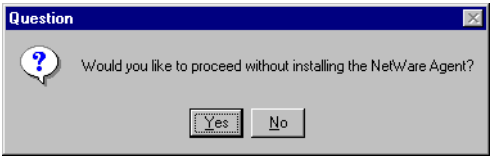

Figure 3-25. NetWare Agent Not Install Question

Click **Yes** to proceed with the installation without installing the NetWare Agent. Go to step 18.

Click **No** to return to the *Choose Destination Location* window.

17. The NetWare *Select Components* dialog displays (see figure 3-26):

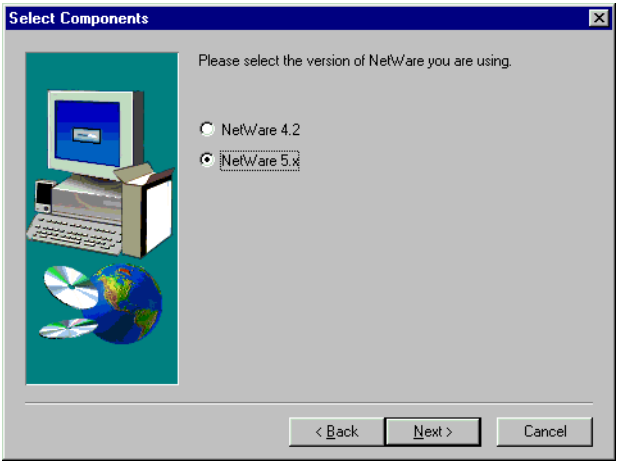

Figure 3-26. NetWare Select Components Dialog

Select the version you wish to install, then click **Next**.

18. The QLconfig *Setup Complete* dialog displays (see figure 3-27):

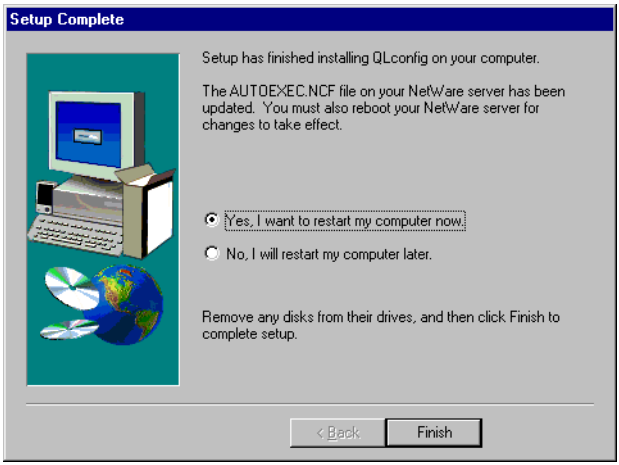
Setup Complete
Setup has finished installing QLconfig on your computer.
The AUTOEXEC.NCF file on your NetWare server has been updated. You must also reboot your NetWare server for changes to take effect.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish

Figure 3-27. QLconfig for Fibre Setup Complete Dialog

Do one of the following:

- ❑ Select **Yes** to restart the computer now. Click **Finish**.

  or

- ❑ Select **No** to restart the computer later. Click **Finish**.

19. If you are using a system configuration that includes a NetWare server, do one of the following at the NetWare server:

    - ❑ Reboot

      or

    - ❑ Enter the following commands at the NetWare command prompt:

      RPCSTART.NCF

      LOAD NWSL -r

      LOAD NWDMI2

      LOAD NWCDMI

      LOAD ONCSP

      LOAD QLCAgent

QLconfig is now ready for you to use. Refer to section 4 for descriptions of the main windows and section 5 for instructions on setting up and using QLconfig.

Section 4
QLconfig Windows

4.1
Introduction

This section describes the menu options and features of the main QLconfig windows. Refer to section 5 for instructions on using these and other QLconfig windows and dialogs to set Storage Area Network (SAN) configuration and availability options.

4.2
Main Window

When you open QLconfig and make at least one connection to a machine, the QLconfig main window (*QLogic Fibre Channel QLconfig*) displays (see figure 4-1):

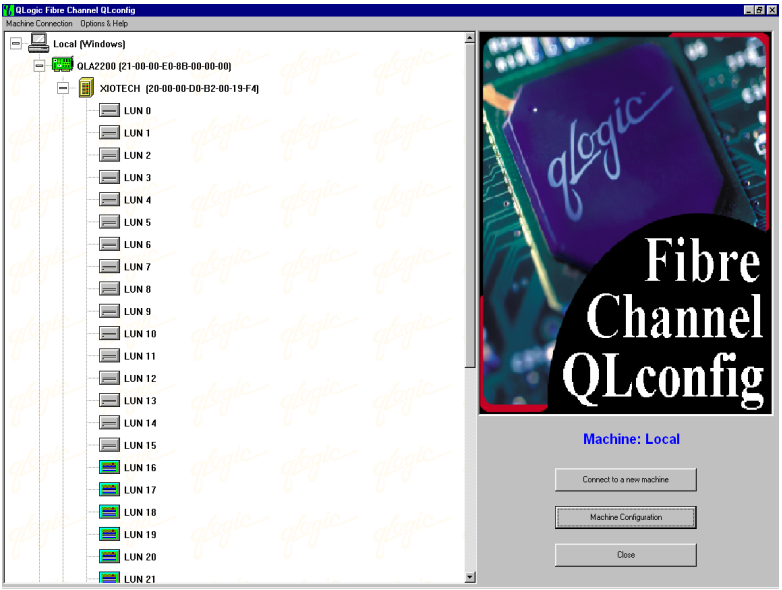

Figure 4-1. QLconfig Main Window (QLogic Fibre Channel QLconfig)

You activate functions and operations from the main window with menu options, menus, and buttons.

The QLconfig main window consists of three sections:

- The main menu options on the top part of the window
- A map of all connected machines and their QLA2xxx adapters, target devices, and Logical Unit Numbers (LUN) on the left side of the window
- A graphic with the QLogic logo, the name of the currently selected machine, the **Connect to New Machine** button, and the **Machine Configuration** button on the right side of the window

4.2.1 Machine Mapping Tree

The machine mapping tree displays each machine connected to QLconfig. The hierarchical order of each machine consists of the following four layers:

- Machine name (Windows or NetWare Server)
- QLA2xxx adapter number and name
- Target device name
- LUN

The + icon next to the machine tells you that there are components connected to this machine. You can click on the + icon to view these components (see figure 4-1).

To select a QLA2xxx adapter on a machine, expand the machine's QLA2xxx adapter list by double-clicking on the machine name or single-clicking on the + icon next to the machine name. To expand or collapse any portion of the tree, click anywhere on the appropriate icon.

Right-click on the icons to display their menus. From these menus, you can select the component's operation options. After you select a machine or adapter, the name of the machine displays in the section below the QLogic logo on the right side of the window.

4.2.2
Menu Options

The QLconfig main window contains two menus: **Machine Connection** and **Options & Help**.

4.2.2.1
Machine Connection

This menu selection connects the application to a machine, locally or remotely, and terminates that connection. The menu contains two options:

- **Connect to Machine**. This option opens the *New Machine Connection* window.
- **Disconnect from Machine**. This option disconnects QLconfig from the currently selected machine. When a machine is disconnected, its entry in the Machine Tree is removed.

4.2.2.2
Options & Help

This menu contains three options:

- **Options**. This option displays the *QLconfig Configuration* window, which enables you to access extended help and set up target device and LUN sharing among connected machines.
- **Help Topics**. This option displays the help file.
- **About QLogic Configuration**. This option displays the QLconfig version number and application date.

4.2.3
Menus

When you right-click on the machines or QLA2xxx adapters in the machine mapping tree, a menu displays. This menu consists of the functions that you can perform on the machines or QLA2xxx adapters.

4.2.3.1
Machine Menu

Right-click on a machine in the machine mapping tree to display the following menu options:

- **Configure Machine**. Select this option to open the *Device and LUN Configuration* window for the selected machine. Use this window to configure the machine's devices and LUNs.
- **Save and Apply Machine Configuration**. Select this option to immediately save and apply machine configuration changes you have made in the *Device and LUN Configuration* window. You do not need to reboot the machine for a new configuration to be effective.
- **Save Configuration to Machine Registry**. Select this option to save configuration changes you have made in the *Device and LUN Configuration* window into that machine's registry. You must reboot the machine for the new configuration to become effective.
- **Delete Selected Adapter's Registry Data**. Select this option to delete the selected machine's registry data. This action effectively puts that machine into a default mode of operation where no configuration has been made in the next reboot.

4.2.3.2
QLA2xxx Adapter Menu

Right-click on a QLA2xxx adapter in the machine mapping tree to display the following menu options:

- **Adapter's List of Devices**. Displays the *Adapter Device List* dialog (see figure 4-2):

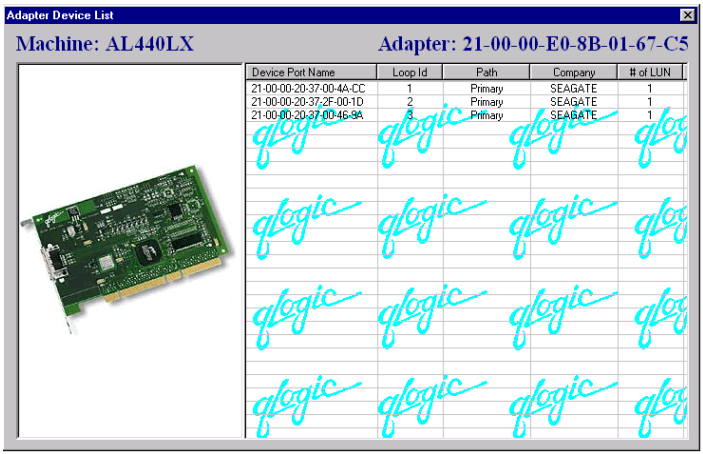

Figure 4-2. Adapter Device List

- **Adapter Information**. Displays the *Adapter Information* dialog (see figure 4-3):

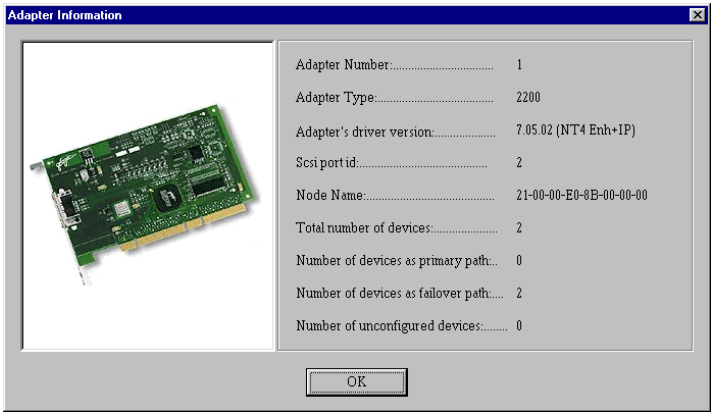
Adapter Information
Adapter Number: 1
Adapter Type: 2200
Adapter's driver version: 7.05.02 (NT4 Enh+IP)
Scsi port id: 2
Node Name: 21-00-00-E0-8B-00-00-00
Total number of devices: 2
Number of devices as primary path: 0
Number of devices as failover path: 2
Number of unconfigured devices: 0
OK

Figure 4-3. Adapter Information Dialog

4.2.3.3
Target Device Menu

Right-click on a target device in the machine mapping tree to display the following menu options:

- **Device's LUN List**. Displays the *Device's LUN List* dialog (see figure 4-4):

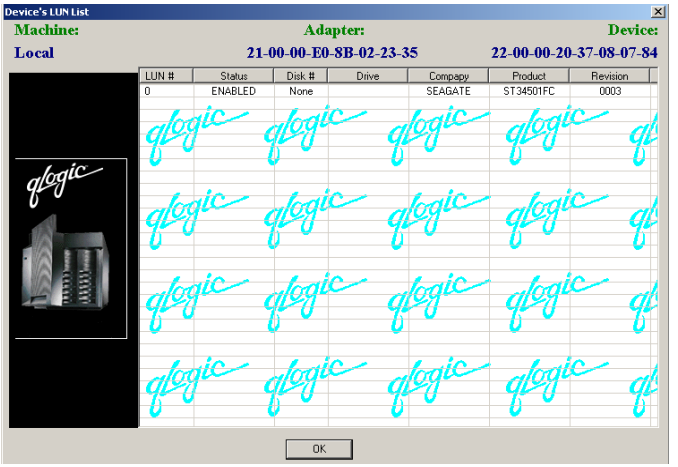

Figure 4-4. Device's LUN List

- **Device Information**. Displays the *Device Information* dialog (see figure 4-5):

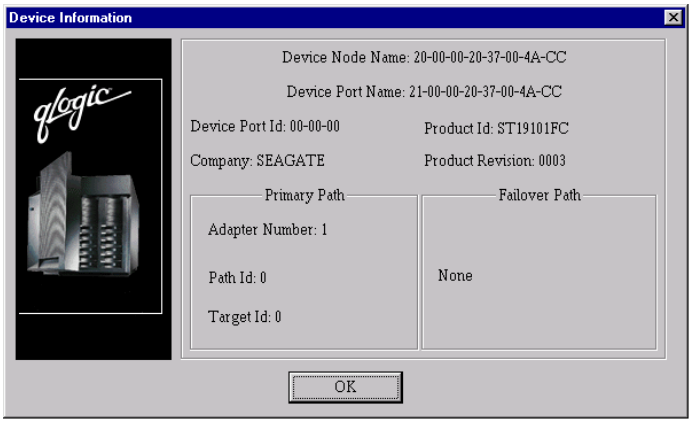

Figure 4-5. Device Information Dialog

4.2.3.4
LUN Menu

Right-click on a LUN in the machine mapping tree to access the **LUN Information** menu option. This option opens the *LUN Information* dialog (see figure 4-6):

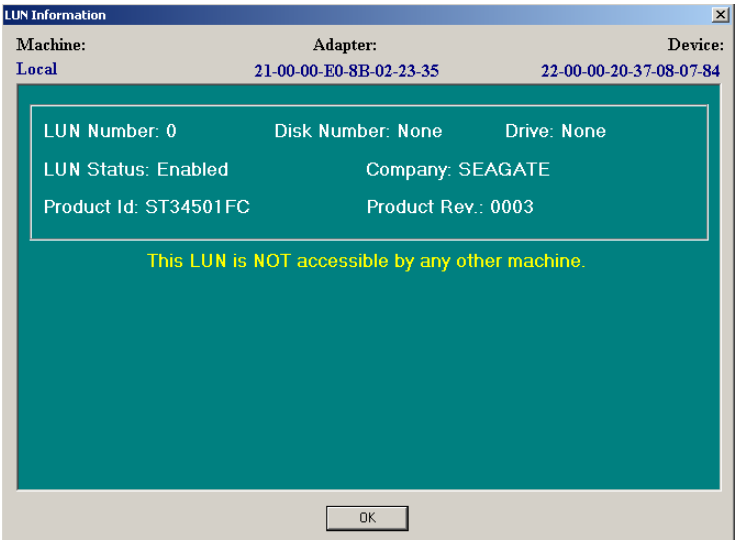

Figure 4-6. LUN Information Dialog

4.2.4
Buttons

Three buttons for frequently used operations are located at the bottom right side of the QLconfig main window:

- **Connect to a new machine**. Click this button to open the *New Machine Connection* window.
- **Machine Configuration**. Click this button to open the *Device and LUN Configuration* window.
- **Close**. This button performs the same function as the **File>>Close** menu option, which closes the application.

4.3
New Machine Connection Window

When you click the **New Machine Connection** button on the QLconfig main window, the *New Machine Connection* window displays (see figure 4-7):

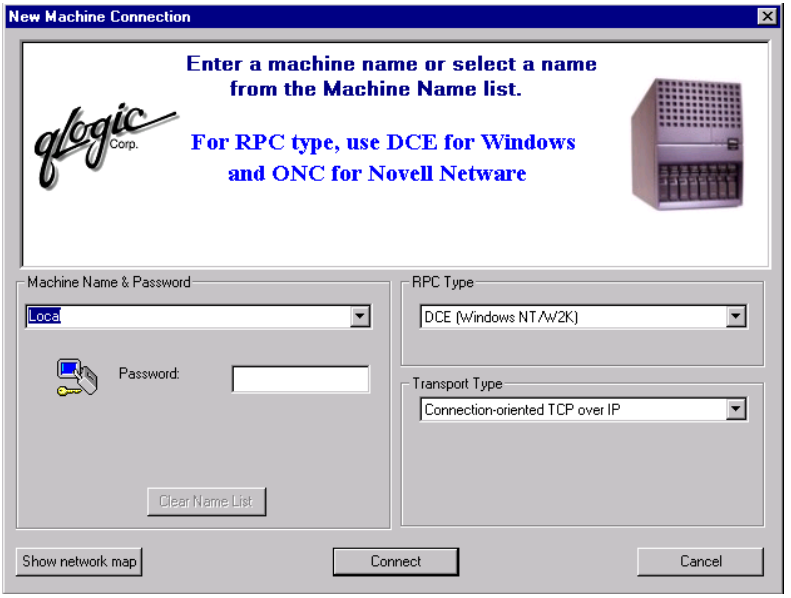

Figure 4-7. New Machine Connection Window

Use this window to enter the name of the system to which you want to connect and the transport type used for the connection. This window also lists the names of all computers currently on the network to assist you in finding the names of the machines.

4.3.1
Options

The *New Machine Connection* window contains the following options:

- Machine Name. This field provides a drop-down menu of available machines (or accepts machine names that you type in this field) to which you can connect. After you establish the Desktop Management Interface (DMI) connection, QLconfig saves this remote machine's name in the drop-down menu.
- RPC Type. This field provides a drop-down menu of available Remote Procedure Call (RPC) types.
- Transport Type. This field provides a drop-down menu of available transport types for the DMI connection.

4.3.2
Buttons

The *New Machine Connection* window contains the following buttons:

- **Show Network Map**. This button helps you find the machine names. When you click this button, it launches the *Map Network Drive* window, which maps a logical drive to a machine on the network. It displays the names of all the connectable machines and the domains to which the machines belong.
- **Clear Name List**. This button deletes all machines on the list except Local.
- **Connect**. This button connects to the machine you specify in this window.
- **Cancel**. This button closes the *New Machine Connection* window attempting to connect to any machines.

4.4
Device and LUN Configuration Window

When you click the **Machine Connection** button on the QLconfig main window, the *Device and LUN Configuration* window displays. This window consists of menus, a grid showing the list of QLA2xxx adapters and devices, a status bar displaying the current machine selection, the number of QLA2xxx adapters and devices, and three buttons (see figure 4-8).

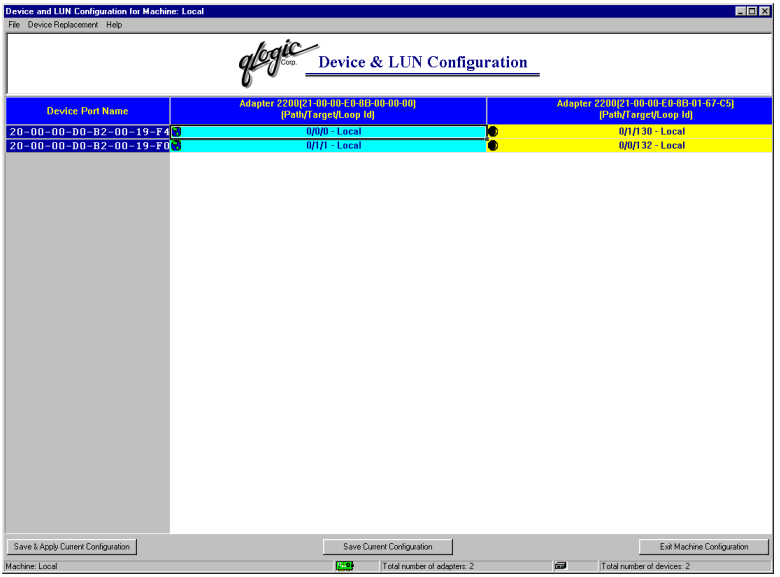

Figure 4-8. Device and LUN Configuration Window

4.4.1
The Grid

The grid is a two-dimensional view of the QLA2xxx adapters and devices in the machine. The top headings show the QLA2xxx adapter and the side headings display the devices' node or port names.

Each cell in the grid represents a path (the device is visible to the QLA2xxx adapter). The cell is color-coded as follows:

- ❑ Cyan. Primary-path device
- ❑ Yellow. Failover-path device (High Availability version only)

  NOTE: If you are using the Standard version of QLconfig, you will not see the yellow designation because there is no failover path in that version. The paths in the Standard version are either primary (cyan) or unconfigured (gray).

- ❑ Gray. Unconfigured device

  NOTE: If you set one target device to unconfigured in the grid, the target device in the column next to it also becomes unconfigured.

- ❑ White. No path

Each cell might also include the following text string to designate its state:

- ❑ Local. This is a device on the local loop.
- ❑ Fabric. This is a device on the fabric.
- ❑ Not Saved. This device configuration has been changed (unconfigured to primary or vice versa) and the new configuration has not been saved.
- ❑ New. This device was added to the QLA2xxx adapter after this application was started.
- ❑ Inactive. This device, although configured in the QLA2xxx adapter's database, is not active, for example, devices that have been physically removed from the system.

To control the grid, use these mouse operations: left-click, left double-click, and right-click. (QLconfig does not support keyboard commands.)

4.4.1.1
Configuring QLA2xxx Adapters

You use mouse clicks in the QLA2xxx adapter grid top heading to activate QLA2xxx adapters, display QLA2xxx adapter information, and display the QLA2xxx adapter menu.

- ❑ Click on a QLA2xxx adapter in the grid heading. QLconfig rearranges the grid to reflect the new order. The selected QLA2xxx adapter's devices always display at the top of the grid.
- ❑ Double-click on the QLA2xxx adapter to display a dialog with detailed information about the QLA2xxx adapter.
- ❑ Right-click on a QLA2xxx adapter to activate it and display a menu. The menu shows only the valid options. If you are using the QLconfig High Availability version, the following menu options can be available. If you are using the QLconfig Standard version, only **Adapter Information** is available.
  - ❑ **Configure using default**. Select this option to restore the QLA2xxx adapter's default settings. If you are running the QLconfig High Availability version, it sets the unconfigured devices on this QLA2xxx adapter to either primary or failover according to the following rules:
    - ❑ If this device is not accessible by any other QLA2xxx adapter on this system, it is set to primary.
    - ❑ If this device is accessible by another QLA2xxx adapter and is unconfigured on that QLA2xxx adapter, it is set to primary.
    - ❑ If this device is accessible by another QLA2xxx adapter and is set as failover on that QLA2xxx adapter, it is set to primary.
    - ❑ If this device is accessible by another adapter and is already set as primary on that QLA2xxx adapter, it is set to failover.
  - ❑ **Configure using alternate**. QLconfig sets the unconfigured devices to either primary or failover according to the rules defined in the *Configure using default* bullet. QLconfig tries to alternate primary and failover devices. This process attempts to do load balancing between devices shared by two QLA2xxx adapters in the same system.
  - ❑ **Unconfigure all**. QLconfig sets all of the configured devices on this QLA2xxx adapter to unconfigured only if the QLA2xxx adapter supports device configuration.

- **Adapter information**. This option displays the *Adapter Information* dialog (see figure 4-9):

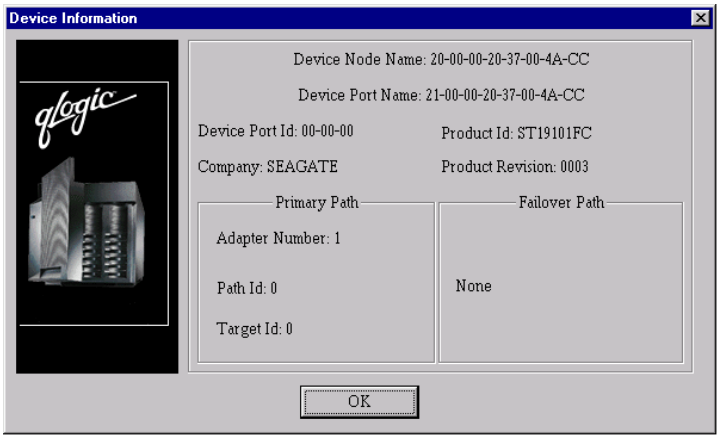

Figure 4-9. Adapter Information Dialog

4.4.1.2 Configuring Target Devices

To configure target devices, use the following mouse clicks in the QLA2xxx grid side heading.

- Double-click on a device in the side column to display a dialog with detailed information about the target device.
- Right-click on a target in the Device Port Name field to display the menu. This menu displays only the valid options. For example, a device that currently has no unconfigured path will not have *Configure using default* in its menu.

  The menu shows only the valid options. If you are using the QLconfig High Availability version, the following menu options can be available. If you are using the QLconfig Standard version, only **Device Information** is available.

- **Configuring using default**. If you are running the QLconfig High Availability version, the unconfigured paths for this device are set to primary or failover according to the following rules:
  - If this device is accessible by only one QLA2xxx adapter, it is set to primary.
  - If this device is accessible by more than one QLA2xxx adapter and all paths are currently unconfigured, the first device path is set to primary and the rest to failover.
  - If this device is accessible by more than one QLA2xxx adapter and one path has been set to primary, the remaining paths are set to failover.
- **Delete device**. Select this option to make a device unavailable to the system as a storage device.
- **Switching primary and failover paths**. If you are running the QLconfig High Availability version, this feature switches the primary and failover paths.
- **Un-configuring all paths (or Un-configuring all)**. The paths for this device are unconfigured. QLconfig prompts you to confirm this action before it is executed.
- **Device Information**. This option is equivalent to double-clicking on a QLA2xxx adapter in the grid top heading.

4.4.1.3
Configuring Paths

To configure paths, use the following mouse clicks in the path (cell).

- Double-click on a cell with valid data in the grid to display the path with more details.
- Right-click on a cell with a valid path to display a menu. This menu shows only valid options. For example, a path that is currently set as primary has no **Set as primary path** in its menu.
  - **Set as primary path**. Use this option to set an unconfigured or failover path to primary.
  - **Set as failover path**. If you are running the QLconfig High Availability version, this option sets an unconfigured or primary path to failover.

- **Set as un-configured**. This option sets a primary or failover path to unconfigured.

  NOTE: For the three options above, if the path belongs to a multipath device (can be accessed by more than one QLA2xxx adapter), the other paths are automatically adjusted to make sure that there is only one path designated as primary.

- **Set Path LUN Mask**. Use this option to display the *LUN Configuration window*, from which you can configure the machine's devices and LUNs.
- **Path Information**. This option displays the path's detailed information.

4.4.2 Menu Options

The *Device and LUN Configuration* window contains three menus: **File**, **Device Replacement**, and **Help**.

4.4.2.1 File

You can save and delete configurations using this menu. This menu contains five options:

- **Save and Apply the Current Configuration**. This option saves the current configuration to the registry after a validity check, and updates the QLA2xxx adapter to make the new configuration effective immediately (without rebooting the system).
- **Save Configuration to the Registry**. This option saves the current configuration to the registry after a validity check. The changes do not take effect until the machine is rebooted.
- **Delete Selected Adapter's Registry Data**. This option deletes the selected QLA2xxx adapter's current registry data, if it exists. Consequently, the system has no configured device in the next reboot.
- **Print Configuration**. This option sends the current device setup to the printer.
- **Exit Machine's Configuration**. This option closes the *Device and LUN Machine Connection* window and returns to the QLconfig main window.

4.4.2.2
Device Replacement

You can replace hot-plugged target devices in your SAN system using this menu. This menu contains two options:

- **Start Device Replacement**. This option allows you to start the device replacement process. QLconfig displays a dialog with information on how to proceed with the replacement. If you decide to proceed with the replacement process, QLconfig changes its mouse operation to allow you to select the inactive devices to replace and active devices with which to replace them.
- **Cancel Device Replacement**. This option aborts the device replacement process.

4.4.2.3
Help

This menu displays the help file. Click **Help for Machine Configuration** to display the help for the *Device and LUN Configuration* window.

4.5
LUN Configuration Window

In the *Device and LUN Configuration* window, right-click on a cell in the second column of the grid, then select **Set Path LUN Mask**. The *LUN Configuration* window displays (see figure 4-10):

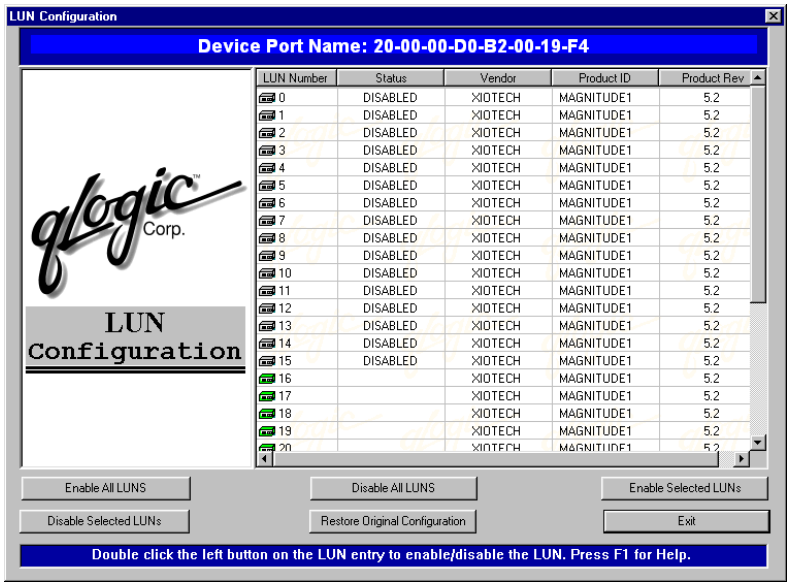
LUN Configuration
Device Port Name: 20-00-00-D0-B2-00-19-F4
qlogic Corp.
LUN Configuration
LUN Number
Status
Vendor
Product ID
Product Rev
0 DISABLED XIOTECH MAGNITUDE1 5.2
1 DISABLED XIOTECH MAGNITUDE1 5.2
2 DISABLED XIOTECH MAGNITUDE1 5.2
3 DISABLED XIOTECH MAGNITUDE1 5.2
4 DISABLED XIOTECH MAGNITUDE1 5.2
5 DISABLED XIOTECH MAGNITUDE1 5.2
6 DISABLED XIOTECH MAGNITUDE1 5.2
7 DISABLED XIOTECH MAGNITUDE1 5.2
8 DISABLED XIOTECH MAGNITUDE1 5.2
9 DISABLED XIOTECH MAGNITUDE1 5.2
10 DISABLED XIOTECH MAGNITUDE1 5.2
11 DISABLED XIOTECH MAGNITUDE1 5.2
12 DISABLED XIOTECH MAGNITUDE1 5.2
13 DISABLED XIOTECH MAGNITUDE1 5.2
14 DISABLED XIOTECH MAGNITUDE1 5.2
15 DISABLED XIOTECH MAGNITUDE1 5.2
16 XIOTECH MAGNITUDE1 5.2
17 XIOTECH MAGNITUDE1 5.2
18 XIOTECH MAGNITUDE1 5.2
19 XIOTECH MAGNITUDE1 5.2
Enable All LUNS
Disable All LUNS
Enable Selected LUNs
Disable Selected LUNs
Restore Original Configuration
Exit
Double click the left button on the LUN entry to enable/disable the LUN. Press F1 for Help.

Figure 4-10. LUN Configuration Window

The top of the window displays the port name of the device to which this LUN configuration is connected. The window also displays the list of all the device's LUNs. You use this window to configure the machine's devices and LUNs.

4.5.1
LUN Configuration Columns

The LUN configuration columns display the following information for each LUN:

- LUN number. The LUN number ranges from 0 to 255. This column also contains an icon that indicates whether this LUN is enabled or disabled.
- Status. If the LUN is disabled, this column displays *DISABLED*. If the LUN is enabled, this column is empty.
- Vendor. The column lists the LUN manufacturer. This column is empty if this is not an existing LUN.
- Product ID. This column displays the LUN product ID. This column is empty if this is not an existing LUN.
- Product Rev. This column displays the LUN product revision number. This column is empty if this is not an existing LUN.

4.5.2
LUN Configuration Buttons

The *LUN Configuration* window contains the following buttons:

- **Enable All LUNs**. Click this button to enable all of the LUNs in the list.
- **Disable All LUNs**. Click this button to disable all of the LUNs on the list.
- **Enabled Selected LUNs**. Click this button to enable all of the LUNs that you have highlighted in the list. To select a range of LUNs, click on one LUN, hold the <SHIFT> key down, then click on another LUN. These LUNs and those in between are selected. To select LUNs that are not in sequence, click on one, then hold the <CTRL> key down and click additional LUNs.
- **Disabled Selected LUNs**. Click this button to disable all of the LUNs you highlighted in the list. To select a range of LUNs, click on one LUN, hold the <SHIFT> key down, then click on another LUN. These two LUNs and those in between are selected. To select LUNs that are not in sequence, click the first one, then hold the <CTRL> key down and click additional LUNs.
- **Restore Original Configuration**. Click this button to restore the device's original LUN configuration settings the next time you start the application.
- **Exit**. Click this button to close the *LUN Configuration* window and return to the QLconfig main window.

4.6 Options Window

The *Options* window allows you to set the configurable options in the application, including extended help, target device sharing, and LUN sharing among connected machines. To set these options, select **Options & Help>>Options** from the QLconfig main window to display the *QLconfig Options* window (see figure 4-11):

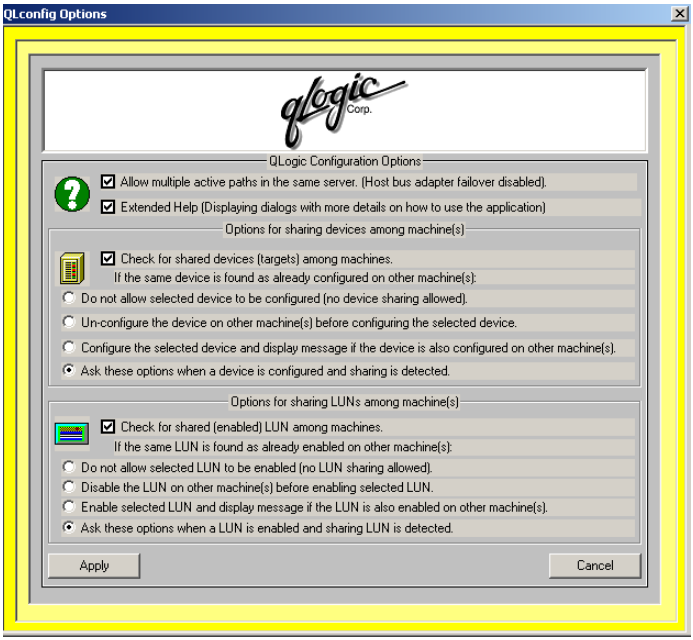
QLconfig Options
QLogic Corp.
QLogic Configuration Options
Allow multiple active paths in the same server. (Host bus adapter failover disabled).
Extended Help (Displaying dialogs with more details on how to use the application)
Options for sharing devices among machine(s)
Check for shared devices (targets) among machines.
If the same device is found as already configured on other machine(s):
Do not allow selected device to be configured (no device sharing allowed).
Un-configure the device on other machine(s) before configuring the selected device.
Configure the selected device and display message if the device is also configured on other machine(s).
Ask these options when a device is configured and sharing is detected.
Options for sharing LUNs among machine(s)
Check for shared (enabled) LUN among machines.
If the same LUN is found as already enabled on other machine(s):
Do not allow selected LUN to be enabled (no LUN sharing allowed).
Disable the LUN on other machine(s) before enabling selected LUN.
Enable selected LUN and display message if the LUN is also enabled on other machine(s).
Ask these options when a LUN is enabled and sharing LUN is detected.
Apply
Cancel

Figure 4-11. QLconfig Options Window

You can configure the following features from the *Options* window:

- ❑ QLogic Configuration Options. This feature enables you to do the following:
  - ❑ Set both paths to primary. When both paths to a device are set to primary, QLA2xxx adapter failover is disabled (High Availability option only).
  - ❑ Select extended help to display help dialogs after important operations such as configuration of target devices and their LUNs. These dialogs inform you of the operation performed, its impact, and the next steps you should follow to complete the operation.

This option is helpful for novice users who are not certain of what to do and want to find quick help. It may become repetitive to experienced users and can be turned off.

- Options for sharing devices among machine(s). This feature enables you to synchronize the sharing of target devices among connected machines. If you disable this option, QLconfig does not check the configured devices.
- Options for sharing LUNs among machine(s). This option enables you to synchronize the sharing of a target devices' LUNs among connected machines. If you disable this option, QLconfig does not check when a LUN is enabled. If you enable this option, QLconfig searches all the connected machines to see if the enabled LUNs are also enabled on other machines. If they are, QLconfig will take action depending on the options you have selected in the QLogic Configuration Options and Options for sharing devices among machine(s) fields.

4.7 Help Topics

When you select **Options & Help>>Help Topics** from the QLconfig main window, the *Help Topics* window displays (see figure 4-12):

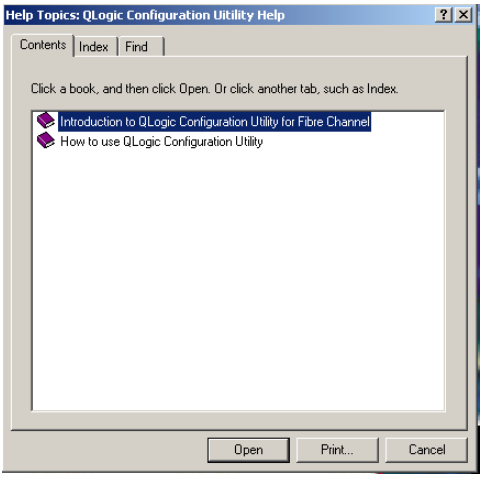
Help Topics: QLogic Configuration Utility Help
Contents
Index
Find
Click a book, and then click Open. Or click another tab, such as Index.
Introduction to QLogic Configuration Utility for Fibre Channel
How to use QLogic Configuration Utility
Open
Print...
Cancel

Figure 4-12. Help Topics Window

You can access QLconfig information and instructions from the *Contents*, *Index*, or *Find* pages in this window.

4.8
About QLconfig Configuration

When you select **Options & Help>>About QLogic Configuration** from the QLconfig main window, the following *About QLogic QLconfig* dialog displays for the Standard version of QLconfig (see figure 4-13):

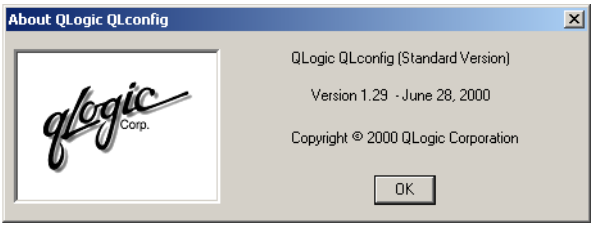

Figure 4-13. About QLconfig Dialog, Standard Version

This dialog displays the QLconfig version number and software release date.

If you have the High Availability version of QLconfig, the following *About QLogic QLconfig* dialog displays (see figure 4-14):

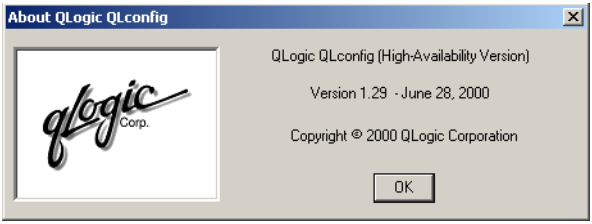

Figure 4-14. About QLconfig Dialog, High Availability Version

4.9
QLconfig Security

The agent is the software that allows the configuration of QLA2xxx adapters, devices, and LUNs. In the *QLogic Configuration Agent Control* window (see figure 4-15), administrator-level users enter a password to control access to the system from QLconfig and make configuration changes to the system devices and LUNs.

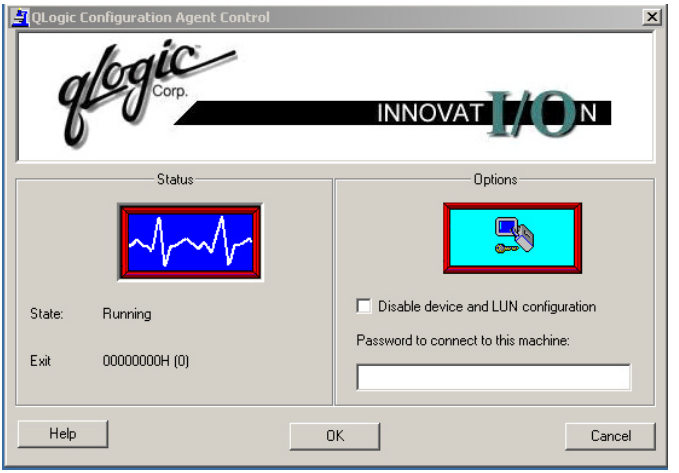

Figure 4-15. QLogic Configuration Agent Control Window (QLconfig Security)

The *QLogic Configuration Agent Control* window displays when you select **Start>>Programs>>QLogic Management Suite>>QLconfig>>QLconfig Security** from your desktop.

Section 5
Using QLconfig

5.1 Introduction

This section provides step-by-step instructions on using QLconfig to configure and manage Fibre Channel Storage Area Networks (SANs). See section 4 for descriptions of the QLconfig windows and dialogs.

QLconfig enables you to perform four types of operations to configure a device in the system:

- ❑ Disable (unconfigure) a device on a QLA2xxx adapter: When you unconfigure a device, it is no longer recognized by the QLA2xxx adapter and is inaccessible to that QLA2xxx adapter on that system.
- ❑ Enable a device: You can add a device and make it accessible to the QLA2xxx adapter on the system.
- ❑ Designate a device as a secondary path for failover: When a device is accessible from more than one QLA2xxx adapter in the same system, and you are using the QLconfig High Availability version, you can assign one path as the primary path and the other one as the failover path. In this configuration, if the primary path fails, the system switches to the failover path to assure that the transfer of data is not interrupted.

  NOTE: For Windows NT and Windows 2000 systems, this feature requires the installation of QLdirect (see section 2.3).

- ❑ Remove a device and replace it with one that has been inserted: In a hot-plug environment, the QLA2xxx adapter does not automatically purge a device that has been physically removed. Likewise, it does not delete a device that is no longer accessible because of errors or failure. Internally, the QLA2xxx adapter keeps the device in its database and marks it as unconfigured. When you insert a new device, the QLA2xxx adapter simply adds it to the database. Thus, with QLconfig, you can delete the removed device's data from the QLA2xxx's database and assign the inserted device the same slot as the one that it replaces.

5.2 Getting Started with QLconfig

QLconfig consists of three separate components:

- ❑ QLconfig Agent. The agent is the software that allows the configuration of QLA2xxx adapters, devices, and Logical Unit Numbers (LUNs).
- ❑ QLconfig Security. This application allows you to set the password for access to the agent and to enable/disable device and LUN configuration.
- ❑ QLconfig Application. This Graphical User Interface (GUI) application provides the user interface for configuring QLA2xxx adapters.

NOTE: Both components require the installation and execution of the Intel DMI 2.0 Service Provider.

5.2.1 Launching QLconfig Security

The QLconfig security application allows you to specify whether to enable or disable the configuration of the system's devices and LUNs. It also displays the current state of the QLconfig Security application (QLconfig NT Agent) service and the last error code, if any. This program also allows administrator-level users to enter a password to control access to the system from QLconfig.

To access the QLconfig Security application, follow these steps:

1. Select **Start>>Settings>>Control Panel>>Services** to start the QLconfig NT Agent.
2. Verify that the service is started. If the service is not started, start it by highlighting the service and clicking on the **Start** button.
3. Select **Start>>Programs>>QLogic Management Suite>> QLconfig>>QLconfig Security**.

The QLconfig security window *(QLogic Configuration Agent Control)* displays (see figure 5-1):

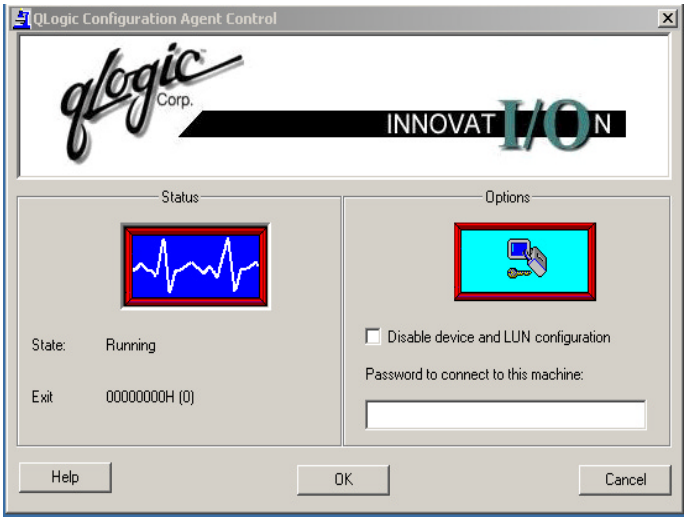

Figure 5-1. QLogic Configuration Agent Control Window (QLconfig Security)

For help with this window, click **Help** or press **F1**.

5.2.2 Using the QLconfig NetWare Security Application

You must have administrator-level authority to run and change this application's setup. This program allows you to enable or disable configuration changes of the system's target devices and LUNs.

To specify configuration changes, follow these steps:

1. Type UNLOAD QLCAGENT at the NetWare command prompt to unload the QLCAGENT.NLM.
2. Type LOAD QLCSEC at the NetWare command prompt.
3. In the *QLogic Agent Control* window, enter the password.

4. At the Enable remote QLA2xxx adapter configuration from client? prompt, enter **Y** to allow remote access or **N** to disable it.

   If you enter **N**, you will not be able to set up failover or any other QLconfig feature on your NetWare server.

5. Type LOAD QLCAGENT at the NetWare command prompt to reload the QLCAGENT.NLM.

   NOTE: QLSEC.NLM is a shared utility between QLconfig and QLview. Changes you make using QLCSEC.NLM will affect both programs.

5.2.3 Launching QLconfig

To launch QLconfig, do one of the following:

- ❑ Select **Start>>Programs>>QLogic Management Suite>>QLconfig**.

  or

- ❑ Double-click on the QLconfig desktop icon (see figure 5-2):

Figure 5-2. QLconfig Desktop Icon

The *New Machine Connection* window displays (see figure 5-3). You are now ready to connect to a machine (see section 5.2.4).

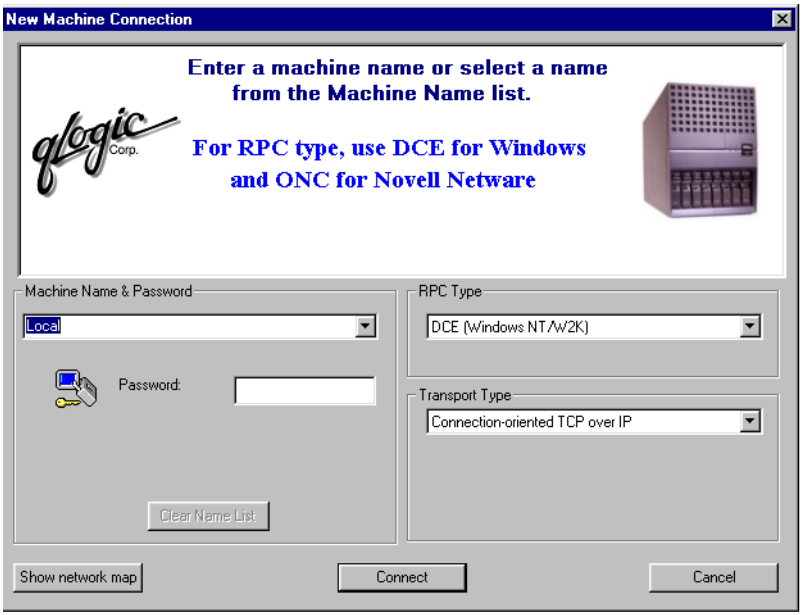

Figure 5-3. New Machine Connection Window

Once you connect to a machine, the QLconfig main window (*QLogic Fibre Channel QLconfig*) displays (see figure 5-4). You can now configure machines and QLA2xxx adapters.

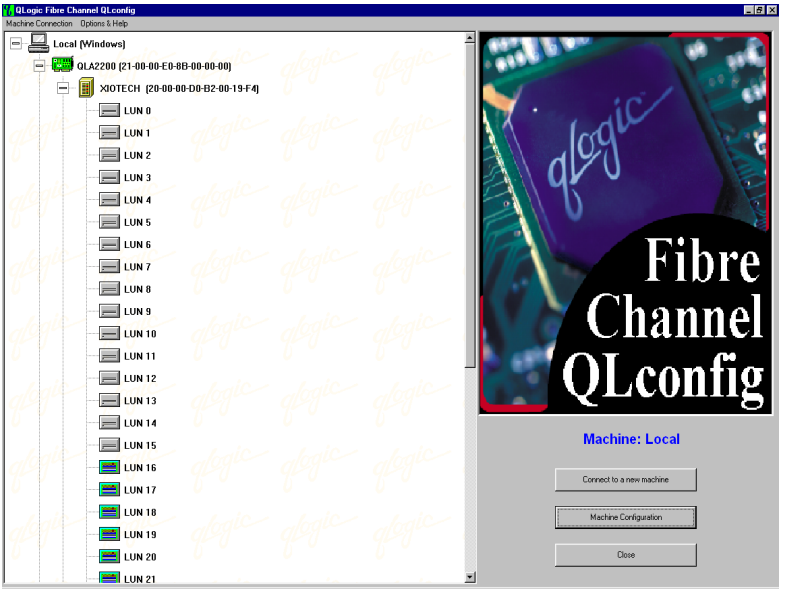

Figure 5-4. QLogic Fibre Channel QLconfig Window (QLconfig Main Window)

5.2.4
Connecting to a Machine

1. To set up a DMI connection to a machine, do one of the following:

   ❑ Launch QLconfig.

   or

   ❑ Select **Machine Connection>>Connect to Machine** from the QLconfig main window.

   or

   ❑ Click **Connect to a new machine** from the QLconfig main window.

The *New Machine Connection* window displays (see figure 5-5):

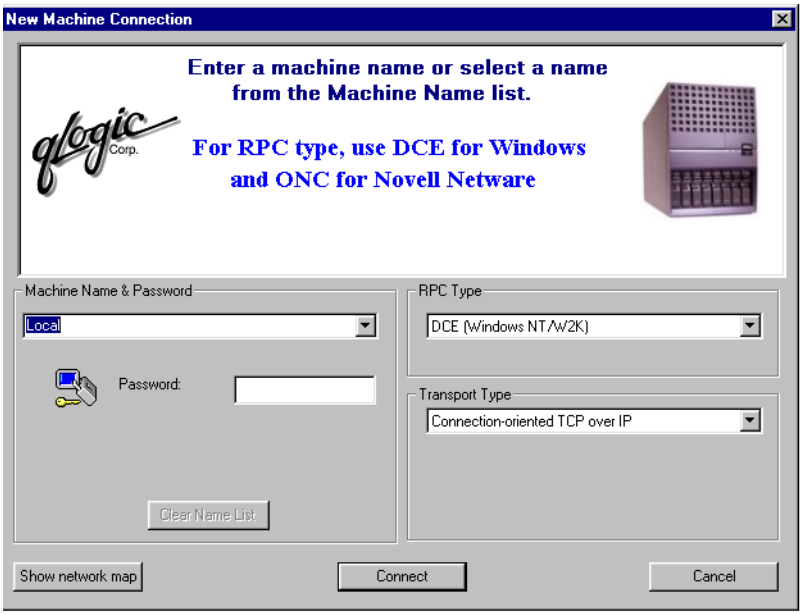

Figure 5-5. New Machine Connection Window

2. In the Machine Name field, do one of the following:
   - ❑ Select **Local** from the drop-down menu to connect to a local machine.

     or
   - ❑ Select a remote device name from the drop-down menu, or type the remote machine's name in the field. You can find the system's machine name by clicking the **Show network map** button.

     or
   - ❑ Click **Clear Name List** to delete all of the machines on the list except Local. (Local cannot be deleted.)

3. For help in finding the correct machine name, click **Show network map** to open the *Map Network Drive* window (see figure 5-6):

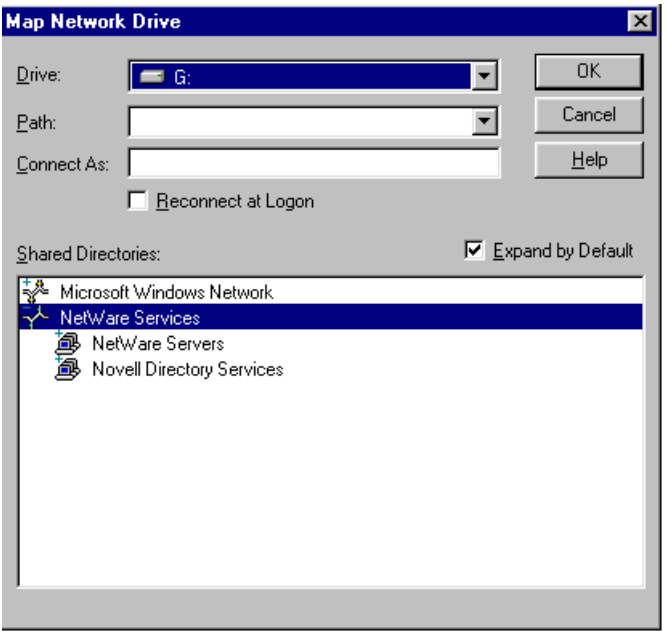

Figure 5-6. Map Network Drive Window

This dialog displays the names of all the connectable machines and the domains to which the machines belong. Use this dialog to list the available machines; do not use this dialog to map a logical drive to a machine on the network.

After the DMI connection is established to a remote machine, QLconfig adds it to the Machine Name drop-down menu for future use.

To delete the names of remote machines from the Machine Name drop-down menu, click **Clear Name List** on the *New Machine Connection* window. When the confirmation dialog displays, select **Yes** to clear all the names.

4. Enter your password if a password was set using QLconfig security (see section 4.9 and section 5.2.1).
5. From the RPC Type field drop-down menu, select Distributed Computing Environment (**DCE**) for Windows or Open Network Computing (**ONC)** for Novell NetWare. (DCE is the default.)
6. Click on the Transport Type field drop-down menu, then select a transport type for the Desktop Management Interface (DMI) connection.
7. Click **Connect**.

   A dialog informs you that the application is trying to connect to the machine. If the connection attempt fails, an error message is displayed to show you the failure and potential causes. If the connection is successful, the machine's name and its QLA2xxx adapters display on the QLconfig main window mapping tree.

5.2.5
Getting Help

5.2.5.1
Help Topics

To access online help, select **Options & Help>>Help Topics**. This menu selection displays all the help topics available for QLconfig (see figure 5-7):

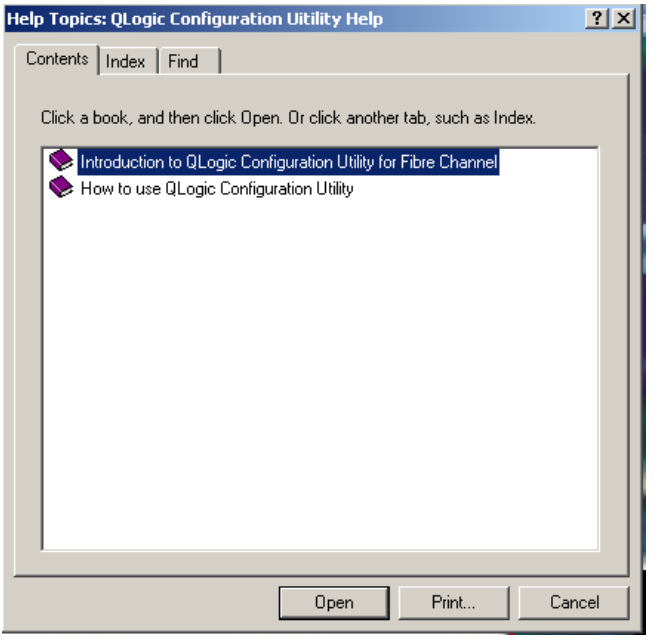
Help Topics: QLogic Configuration Utility Help
Contents
Index
Find
Click a book, and then click Open. Or click another tab, such as Index.
Introduction to QLogic Configuration Utility for Fibre Channel
How to use QLogic Configuration Utility
Open
Print...
Cancel

Figure 5-7. Help Topics Window

5.2.5.2
Extended Help

Extended Help dialogs inform you of the operation performed, its impact, and the next steps you should follow to complete the operation.

To display extended help, follow these steps:

1. Select **Options & Help>>Options**. The *Options* window displays (see figure 5-8):

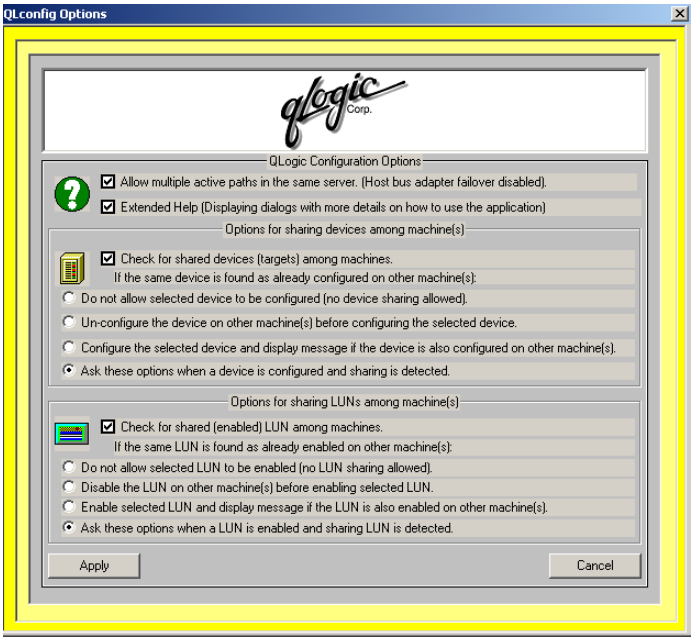
QLconfig Options
QLogic Corp.
QLogic Configuration Options
Allow multiple active paths in the same server. (Host bus adapter failover disabled).
Extended Help (Displaying dialogs with more details on how to use the application)
Options for sharing devices among machine(s)
Check for shared devices (targets) among machines.
If the same device is found as already configured on other machine(s):
Do not allow selected device to be configured (no device sharing allowed).
Un-configure the device on other machine(s) before configuring the selected device.
Configure the selected device and display message if the device is also configured on other machine(s).
Ask these options when a device is configured and sharing is detected.
Options for sharing LUNs among machine(s)
Check for shared (enabled) LUN among machines.
If the same LUN is found as already enabled on other machine(s):
Do not allow selected LUN to be enabled (no LUN sharing allowed).
Disable the LUN on other machine(s) before enabling selected LUN.
Enable selected LUN and display message if the LUN is also enabled on other machine(s).
Ask these options when a LUN is enabled and sharing LUN is detected.
Apply
Cancel

Figure 5-8. Options Window

2. Select **Extended Help** to display help dialogs after important operations such as configuration of target devices and their LUNs.
3. Click **Apply**.

5.2.6
Getting Component Information

5.2.6.1
Machine Information

The Machine field in the right side of the QLconfig main window displays the current machine name. If there is only one connected machine, it is always the selected machine. If there is more than one machine, the connected machine is the one that you select by clicking the left or right mouse button on one of its nodes in the machine tree (the node is highlighted).

When a machine is selected, its name is displayed in the right side of the main window. Subsequent machine operations, such as machine configuration, are performed on this machine.

5.2.6.2
Target Device Information

To access target device information, right-click on the device, then select one of these options from the menu:

- **Device's LUN List**. When this menu option is selected, the target device's LUN List dialog displays (see figure 5-9):

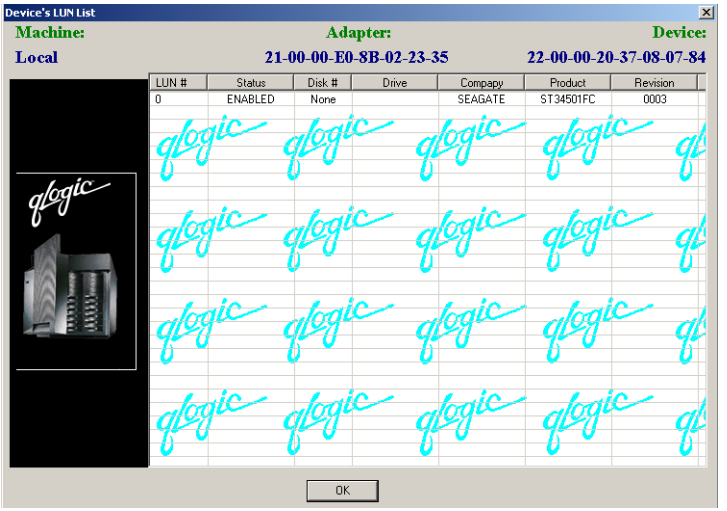

Figure 5-9. Device's LUN List Window

- **Device Information**. Select this menu option to display the *Device Information* dialog (see figure 5-10):

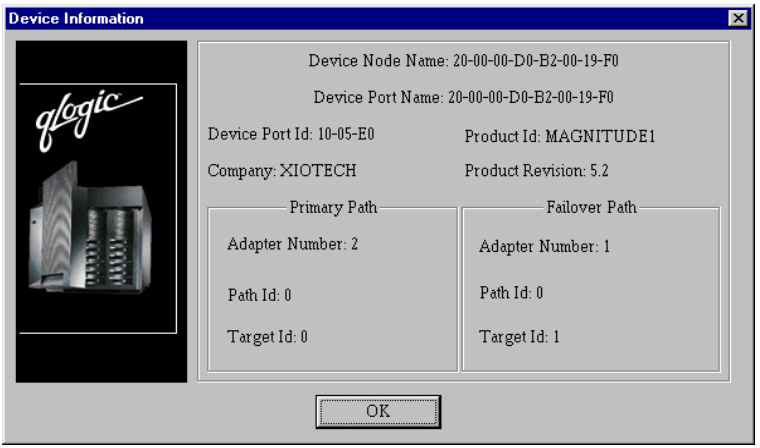

Figure 5-10. Device Information Dialog LUN Information

- Right-click on a LUN, then select **LUN Information** from the menu to display the following dialog (see figure 5-11):

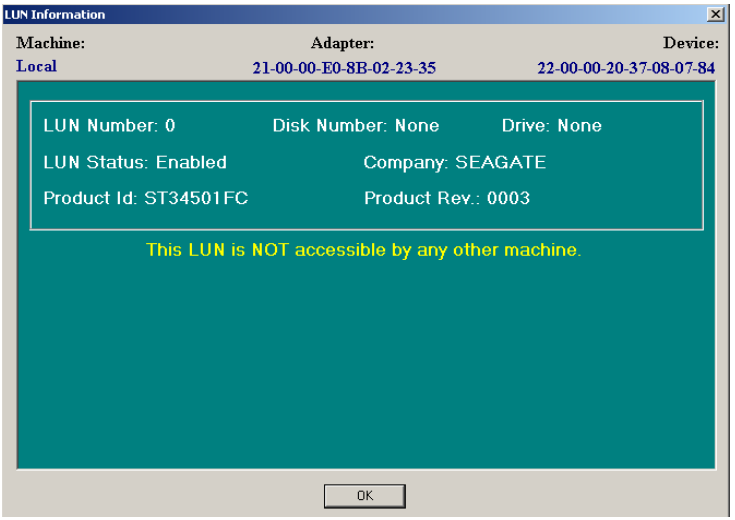

Figure 5-11. LUN Information Dialog

5.2.6.3
QLA2xxx Adapter Information

Right-click on a QLA2xxx adapter to display the following menu options:

- **Adapter's List of Devices**. When this menu option is selected, the *Adapter Device List* dialog displays.
- **Adapter Information**. When this menu option is selected, the *Adapter Information* dialog displays (see figure 5-12):

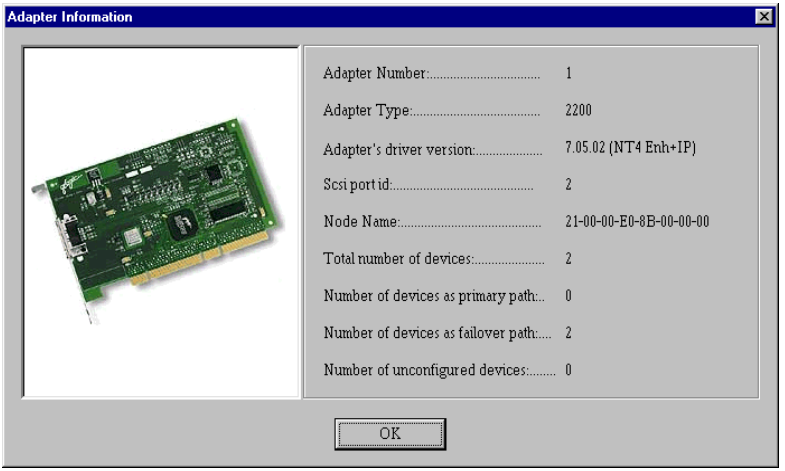
Adapter Information
Adapter Number: 1
Adapter Type: 2200
Adapter's driver version: 7.05.02 (NT4 Enh+IP)
Scsi port id: 2
Node Name: 21-00-00-E0-8B-00-00-00
Total number of devices: 2
Number of devices as primary path: 0
Number of devices as failover path: 2
Number of unconfigured devices: 0
OK

Figure 5-12. Adapter Information Dialog

5.2.6.4
About QLogic Configuration

Select **Options & Help>>About QLogic Configuration** to view the QLconfig version number and application date.

5.2.7
Disconnect from Machine

This option disconnects from the currently selected machine. When a machine is disconnected, its entry in the Machine Tree is removed.

5.2.8
Closing QLconfig

To end the current QLconfig session, click **Close** on the right side of the QLconfig main window.

5.3
Configuring SAN Components

The QLconfig configuration can be applied to the system for dynamic updates or saved to the system's registry. If the configuration is saved, the QLA2xxx adapter retrieves the data from this registry at the next system boot-up and configures the system accordingly. Some older versions of the drivers do not support this registry setting, and the application does not save registry entry for these drivers. Therefore, make sure that you have upgraded to the latest drivers specified in section 2.3.

To configure QLA2xxx adapters, target devices, and paths, do one of the following:

- ❑ Click **Machine Configuration** on the QLconfig main window.

  or

- ❑ Right-click on a machine in the mapping tree side of the QLconfig main window, then select **Configure Machine**.

  The *Device and LUN Configuration* window displays (see figure 5-13):

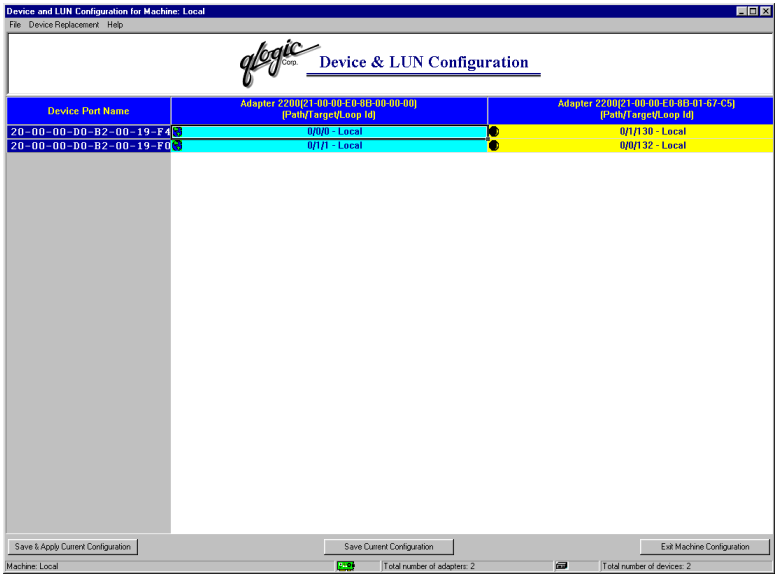

Figure 5-13. Device and LUN Configuration Window

See section 4 for descriptions of this window's menu options.

5.3.1
Using the Device and LUN Configuration Window Grid

The *Device and LUN Configuration* window (see figure 5-13) consists of menus, a grid showing the list of QLA2xxx adapters and devices, a status bar displaying the current machine selection, the number of QLA2xxx adapters and devices, and three buttons.

The grid is a two-dimensional view of the QLA2xxx adapters and devices in the machine. The top headings show the QLA2xxx adapter and the side headings display the devices' node or port names.

Each cell in the grid represents a path (the device is visible to the QLA2xxx adapter). The cell is color-coded as follows:

- ❑ Cyan. Primary-path device
- ❑ Yellow. Failover-path device (High Availability version only)

  NOTE: If you are using the Standard version of QLconfig, you will not see the yellow designation because there is no failover path in that version. The paths in the Standard version are either primary (cyan) or unconfigured (gray).

- ❑ Gray. Unconfigured device

  NOTE: If you set one target device to unconfigured in the grid, the target device in the column next to it also becomes unconfigured.

- ❑ White. No path

Each cell might also include the following text string to designate its state:

- ❑ Local. This is a device on the local loop.
- ❑ Fabric. This is a device on the fabric.
- ❑ Not Saved. This device configuration has been changed (unconfigured to primary or vice versa) and the new configuration has not been saved.
- ❑ New. This device was added to the QLA2xxx adapter after this application was started.
- ❑ Inactive. This device, although configured in the QLA2xxx adapter's database, is not active, for example, devices that have been physically removed from the system.

To control the grid, use these mouse operations: left-click, left double-click, and right-click. (QLconfig does not support keyboard commands.)

5.3.2
Configuring QLA2xxx Adapters

You use mouse clicks in the QLA2xxx adapter grid top heading to activate QLA2xxx adapters, display QLA2xxx adapter information, and display the QLA2xxx adapter menu.

5.3.2.1
Activating a QLA2xxx Adapter

Click on a QLA2xxx adapter in the grid heading. QLconfig rearranges the grid to reflect the new order. The selected QLA2xxx adapter's devices always display at the top of the grid.

5.3.2.2
Displaying QLA2xxx Adapter Information

Double-click on the QLA2xxx adapter to display a dialog with detailed information about the QLA2xxx adapter.

5.3.2.3
Activating QLA2xxx Adapters and Displaying the QLA2xxx Adapter Menu

Right-click on a QLA2xxx adapter to activate it and display a menu. The menu shows only the valid options. If you are using the QLconfig High Availability version, the following menu options can be available. If you are using the QLconfig Standard version, only **Adapter Information** is available.

- **Configure using default**. Select this option to restore the QLA2xxx adapter's default settings. If you are running the QLconfig High Availability version, it sets the unconfigured devices on this QLA2xxx adapter to either primary or failover according to the following rules:
  - If this device is not accessible by any other QLA2xxx adapter on this system, it is set to primary.
  - If this device is accessible by another QLA2xxx adapter and is unconfigured on that QLA2xxx adapter, it is set to primary.
  - If this device is accessible by another QLA2xxx adapter and is set as failover on that QLA2xxx adapter, it is set to primary.
  - If this device is accessible by another adapter and is already set as primary on that QLA2xxx adapter, it is set to failover.

- **Configure using alternate**. QLconfig sets the unconfigured devices to either primary or failover according to the rules defined in the *Configure using default* bullet. QLconfig tries to alternate primary and failover devices. This process attempts to do load balancing between devices shared by two QLA2xxx adapters in the same system.
- **Unconfigure all**. QLconfig sets all of the configured devices on this QLA2xxx adapter to unconfigured only if the QLA2xxx adapter supports device configuration.
- **Adapter information**. This option displays the *Adapter Information* dialog (see figure 5-14):

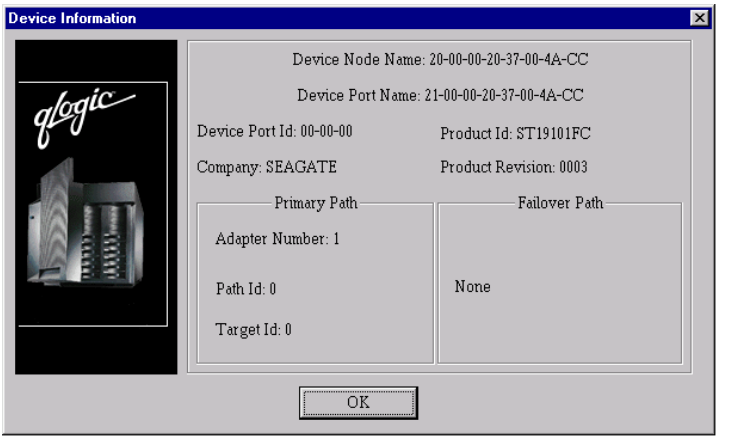

Figure 5-14. Adapter Information Dialog

5.3.3 Configuring Target Devices

To configure target devices, use the following mouse clicks in the QLA2xxx grid side heading:

- Double-click on a device to display information (see section 5.3.3.1).
- Right-click on a target in the Device Port Name field to display the configuration menu (see section 5.3.3.2).

5.3.3.1 Displaying Detailed Target Device Information

Double-click on a device in the side column to display a dialog with detailed information about the target device.

5.3.3.2
Displaying the Target Device Menu

Right-click on a target in the Device Port Name field to display the menu. This menu displays only the valid options. For example, a device that currently has no unconfigured path will not have *Configure using default* in its menu.

The menu shows only the valid options. If you are using the QLconfig High Availability version, the following menu options can be available. If you are using the QLconfig Standard version, only **Device Information** is available.

- **Configuring using default**. If you are running the QLconfig High Availability version, the unconfigured paths for this device are set to primary or failover according to the following rules:
  - If this device is accessible by only one QLA2xxx adapter, it is set to primary.
  - If this device is accessible by more than one QLA2xxx adapter and all paths are currently unconfigured, the first device path is set to primary and the rest to failover.
  - If this device is accessible by more than one QLA2xxx adapter and one path has been set to primary, the remaining paths are set to failover.
- **Delete device**. Select this option to make a device unavailable to the system as a storage device.
- **Switching primary and failover paths**. If you are running the QLconfig High Availability version, this feature switches the primary and failover paths.
- **Un-configuring all paths (or Un-configuring all)**. The paths for this device are unconfigured. QLconfig prompts you to confirm this action before it is executed.
- **Device Information**. This option is equivalent to double-clicking on a QLA2xxx adapter in the grid top heading.

5.3.4
Configuring Paths

To configure paths, use the following mouse clicks in the path (cell):

- Double-click on a cell to display path details (see section 5.3.4.1).
- Right-click on a cell to display the path menu (see section 5.3.4.2).

5.3.4.1
Displaying Path Detail

Double-click on a cell with valid data in the grid to display the path with more details.

5.3.4.2
Displaying the Menu

Right-click on a cell with a valid path to display a menu. This menu shows only valid options. For example, a path that is currently set as primary has no **Set as primary path** in its menu.

- **Set as primary path**. Use this option to set an unconfigured or failover path to primary.
- **Set as failover path**. If you are running the QLconfig High Availability version, this option sets an unconfigured or primary path to failover.
- **Set as un-configured**. This option sets a primary or failover path to unconfigured.

NOTE: For the three options above, if the path belongs to a multipath device (can be accessed by more than one QLA2xxx adapter), the other paths are automatically adjusted to make sure that there is only one path designated as primary.

- **Set Path LUN Mask**. Use this option to display the *LUN Configuration window*, from which you can configure the machine's devices and LUNs.
- **Path Information**. This option displays the path's detailed information.

5.3.5
Saving Configurations

To save configurations, do one of the following:

- Click **Save & Apply Current Configuration** in the *Device and LUN Configuration* window. This menu option saves the current configuration to the registry after a validity check, and updates the QLA2xxx adapter to make the new configuration effective immediately (without rebooting the system).

  or

- Click **Save Current Configuration** in the *Device and LUN Configuration* window. The changes are sent to the machine and are saved in that machine's registry. The changes will not take effect until the machine is rebooted.

  or

- If you have changed the machine's configuration in the *Device and LUN Configuration* window, right-click on the machine, then select **Save and Apply Machine Configuration**. The changes are sent to the machine and become effective immediately (without rebooting the machine).

  or

- If you have changed the machine's configuration in the *Device and LUN Configuration* window, right-click on a machine in the window, then select **Save Configuration to Machine Registry**. The changes are sent to the machine and are saved in that machine's registry. The changes will not take effect until the machine is rebooted.

  or

- Select **File>>Save and Apply the Current Configuration** in the *Device and LUN Configuration* window. This menu option saves the current configuration to the registry after a validity check, and updates the QLA2xxx adapter to make the new configuration effective immediately (without rebooting the system).

  or

- Select **File>>Save Configuration to the Registry** in the *Device and LUN Configuration* window. This menu option saves the current configuration to the registry. Before saving, QLconfig performs a validity check on the configuration. If it detects any illegal settings, such as a device configured as a primary path on more than one QLA2xxx adapter, the registry save is not executed. If QLconfig is exited with the configuration changed and this registry save has not been selected, the application will prompt you to save the configuration (see figure 5-15):

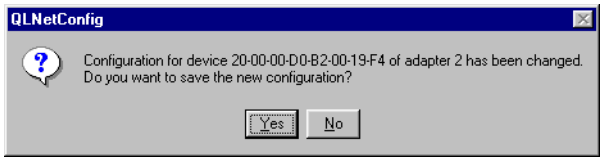
QLNetConfig
Configuration for device 20-00-00-D0-B2-00-19-F4 of adapter 2 has been changed.
Do you want to save the new configuration?
Yes
No

Figure 5-15. Save New Configuration Dialog

5.3.6
Deleting Configuration Data

To delete configuration data from a machine's registry, follow these steps:

1. Do one of the following:
   - ❑ Select **File>>Delete Selected Adapter's Registry Data** in the *Device and LUN Configuration* window. This menu option deletes the selected QLA2xxx adapter's current registry data, if it exists. Consequently, the system has no configured device in the next reboot.

     or
   - ❑ Right-click on a machine in the *Device and LUN Configuration* window, then select **Delete Machine Configuration Registry**.
2. The *Delete Adapter's Registry Data* dialog displays (see figure 5-16):

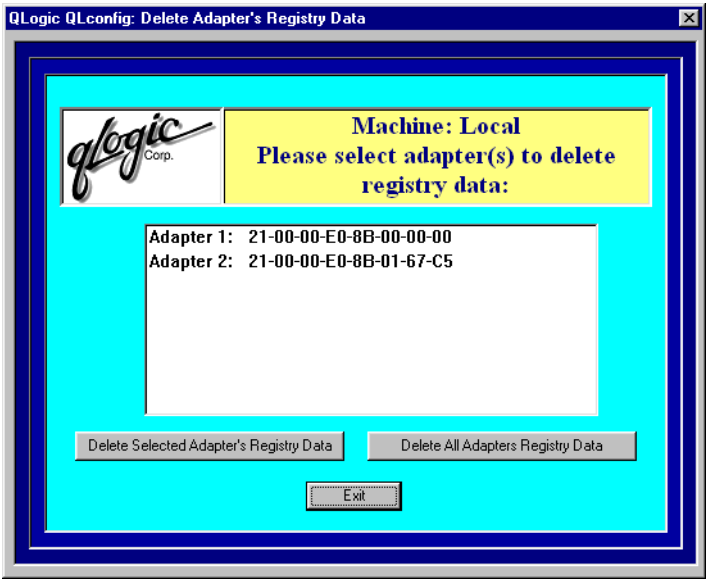

Figure 5-16. Delete Adapter's Registry Data Dialog

Click one of the following:

- ❑ **Delete Selected Adapter's Registry Data**
- ❑ **Delete All Adapters Registry Data**
- ❑ **Exit**

When you select one of these menu options, QLconfig requests the machine to delete its registry data. This action effectively puts that machine into a default mode of operation where no configuration has been made.

5.4 Sharing Components

QLconfig enables you to share target devices and LUNs within your SAN system. To access these features, select **Options & Help>>Options** from the QLconfig main window. The *Options* window displays (see figure 5-17):

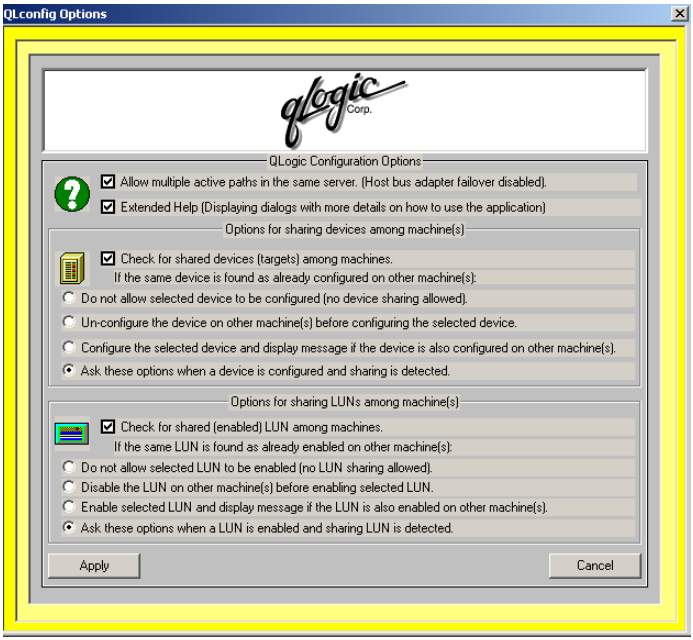
QLconfig Options
QLogic Corp.
QLogic Configuration Options
Allow multiple active paths in the same server. (Host bus adapter failover disabled).
Extended Help (Displaying dialogs with more details on how to use the application)
Options for sharing devices among machine(s)
Check for shared devices (targets) among machines.
If the same device is found as already configured on other machine(s):
Do not allow selected device to be configured (no device sharing allowed).
Un-configure the device on other machine(s) before configuring the selected device.
Configure the selected device and display message if the device is also configured on other machine(s).
Ask these options when a device is configured and sharing is detected.
Options for sharing LUNs among machine(s)
Check for shared (enabled) LUN among machines.
If the same LUN is found as already enabled on other machine(s):
Do not allow selected LUN to be enabled (no LUN sharing allowed).
Disable the LUN on other machine(s) before enabling selected LUN.
Enable selected LUN and display message if the LUN is also enabled on other machine(s).
Ask these options when a LUN is enabled and sharing LUN is detected.
Apply
Cancel

Figure 5-17. Options Window

5.4.1 Sharing Target Devices

In the *Options* window (see figure 5-17), follow these steps:

1. Select **Check for shared devices (targets) among machines**.

   This option synchronizes the sharing of target devices among connected machines. If this option is turned off, the application does not perform any checking when a device is configured.

2. Select the following options as appropriate:

   - ❑ **Do not allow selected device to be configured.** QLconfig rejects the configuration operation and displays a message indicating that the device has been found as configured on another machine and that device sharing is not allowed.
   - ❑ **Un-configure the device on other machine(s) before configuring the selected device.** QLconfig sets the device on the other machines as unconfigured and configures the device on the currently selected machine.
   - ❑ **Configure the selected device and display message if the device is also configured on other machine(s).** The application sets the device on the currently selected machine to configured and displays a message indicating that the same device is also configured on other machines.
   - ❑ **Ask these options when a device is configured and sharing is detected.** The application displays the above-listed options whenever a device is configured and detected as configured on other machines. When this option is turned on and a device is set to configured, QLconfig searches all the connected machines to see if the device is also controllable from other machines. If this device is set as configured on other machines, the application will take action depending on the options you have selected.

3. Click **Apply** to save any changes you make to the options or click **Cancel** to ignore those changes, if any. Both buttons close the dialog and return you to the QLconfig main window.

5.4.2 Sharing LUNs

This option synchronizes the sharing of LUNs among connected machines. The maximum number of LUNs per target device is 256. If this option is turned off, the application does not perform checking when a LUN is enabled. To share LUNs, follow these steps:

1. Select **Options & Help>>Options** from the QLconfig main menu.
2. Select the following options as appropriate:

   - ❑ **Do not allow selected LUNs to be enabled.** The application rejects the LUN enabling operation and displays a message indicating that the LUNs have been enabled on another machine and that LUN sharing is not allowed.

- ❑ **Disable the LUN on other machine(s) before enabling selected LUN.** The application first disables the LUN on the other machines before enabling the LUN on the currently selected machine.
- ❑ **Enabled selected LUN and display message if the LUN is also enabled on other machine(s).** QLconfig enables the LUN on the currently selected machine and displays a message indicating that the same LUN is also enabled on other machines.
- ❑ **Ask these options when a LUN is enabled and sharing LUN is detected.** The application displays the above-listed options whenever a LUN is enabled and detected as enabled on other machines. This option is provided so you can select configuration on an individual LUN basis.

  When this option is turned on and when a device's LUNs are enabled, the application searches all the connected machines to see if those LUNs are also enabled on other machines. If the LUNs are enabled on other machines, the application will take action depending on the options you select.

3. Click **Apply** to save any changes you make to the options or click **Cancel** to ignore those changes, if any. Both buttons close the dialog and return you to the QLconfig main window.

5.5 Replacing Target Devices

You can replace hot-plugged target devices in your SAN system using the *Device and LUN Configuration* window. Follow these steps:

1. Open the *Device and LUN Configuration* window by doing one of the following:
   - ❑ Click **Machine Configuration** on the QLconfig main window.

     or
   - ❑ Right-click on a machine in the mapping tree side of the QLconfig main window, then select **Configure Machine**.

The *Device and LUN Configuration* window displays (see figure 5-18):

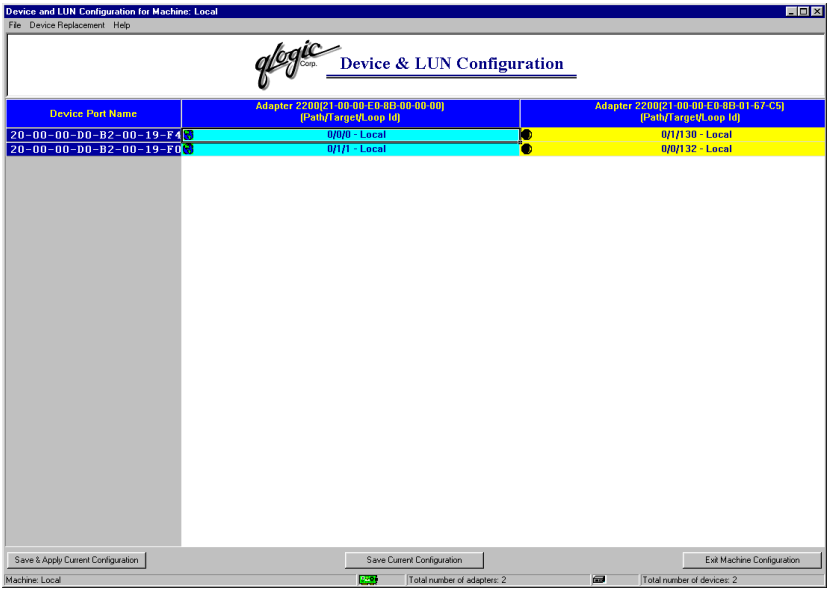

Figure 5-18. Device and LUN Configuration Window

2. Select **Device Replacement>>Start Device Replacement**.

   QLconfig displays a dialog with information on how to proceed with the replacement. If you decide to proceed with the replacement process, QLconfig changes its mouse operation to allow you to select the inactive devices to replace and active devices with which to replace them.

3. Double-click in the cell of the inactive target device that you want to replace.

   This target device must be inactive. Inactive devices are in gray cells in the grid. A dialog displays that shows the QLA2xxx adapter, the inactive target device to be replaced, and the list of active target devices belonging to the same QLA2xxx adapter.

4. In the dialog, click on the active target device you want to replace the inactive one. (You can use the left or the right mouse button.)

5. Click **OK**.

6. Click **Proceed** in the confirmation dialog.

When the replacement is complete, QLconfig updates the list of devices to reflect the new configuration.

You can click **Cancel Device Replacement** to abort the device replacement process and return to normal operation.

5.6 Specifying LUN Access

LUN masking is a method of controlling the assignment of target devices and LUNs when multiple servers share access to a common SAN. You also use LUN masking to control device availability. QLconfig supports masking at the target-device level by enabling you to configure or unconfigure devices. At the LUN level, you use masking to enable or disable LUNs for a QLA2xxx adapter. Dividing LUNs among systems in this manner prevents possible data corruption because there is only one access to storage at any given time.

To set up LUN masking, follow these steps:

1. In the *Device and LUN Configuration* window, right-click on a cell in the second column of the grid, then select **Set Path LUN Mask**. The *LUN Configuration* window displays (see figure 5-19):

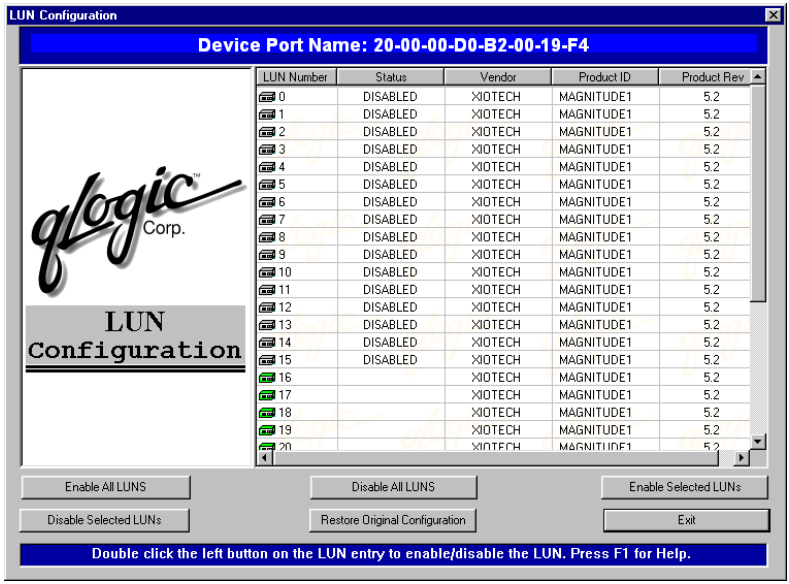
LUN Configuration
Device Port Name: 20-00-00-D0-B2-00-19-F4
LUN Number
Status
Vendor
Product ID
Product Rev
0 DISABLED XIOTECH MAGNITUDE1 5.2
1 DISABLED XIOTECH MAGNITUDE1 5.2
2 DISABLED XIOTECH MAGNITUDE1 5.2
3 DISABLED XIOTECH MAGNITUDE1 5.2
4 DISABLED XIOTECH MAGNITUDE1 5.2
5 DISABLED XIOTECH MAGNITUDE1 5.2
6 DISABLED XIOTECH MAGNITUDE1 5.2
7 DISABLED XIOTECH MAGNITUDE1 5.2
8 DISABLED XIOTECH MAGNITUDE1 5.2
9 DISABLED XIOTECH MAGNITUDE1 5.2
10 DISABLED XIOTECH MAGNITUDE1 5.2
11 DISABLED XIOTECH MAGNITUDE1 5.2
12 DISABLED XIOTECH MAGNITUDE1 5.2
13 DISABLED XIOTECH MAGNITUDE1 5.2
14 DISABLED XIOTECH MAGNITUDE1 5.2
15 DISABLED XIOTECH MAGNITUDE1 5.2
16 XIOTECH MAGNITUDE1 5.2
17 XIOTECH MAGNITUDE1 5.2
18 XIOTECH MAGNITUDE1 5.2
19 XIOTECH MAGNITUDE1 5.2
Enable All LUNS
Disable All LUNS
Enable Selected LUNs
Disable Selected LUNs
Restore Original Configuration
Exit
Double click the left button on the LUN entry to enable/disable the LUN. Press F1 for Help.

Figure 5-19. LUN Configuration Window

The top of the window lists the node name or port name of the device for this LUN configuration. Each LUN in the list has five columns:

- **LUN number**. The LUN number ranges from 0 to 255. This column also has an icon that signifies whether this LUN is enabled or disabled.
- **Status**. If the LUN is disabled, this column has the *DISABLED* text inside. If the LUN is enabled, this column is empty.
- **Vendor**. This is the vendor name of the LUN. This column is empty if this is not an existing LUN.
- **Product ID**. This is the product ID for the LUN. This column is empty if this is not an existing LUN.
- **Product Rev.** This is the product revision number for the LUN. This column is empty if this is not an existing LUN.

2. To configure an individual LUN, double-click on the LUN entry. The LUN is toggled between disabled (status column has the *DISABLED* text) and enabled (the status column is empty).
3. Click on one of the following buttons:
   - **Enable All LUNs**. All the LUNs in the list are enabled.
   - **Disable All LUNs**. All the LUNs are disabled.
   - **Enabled Selected LUNs**. All of the selected (highlighted) LUNs are enabled. To select a range of LUNs, click on one LUN, hold down the <SHIFT> key, then click on another LUN. These two LUNs and those in between are selected. To select LUNs that are not in sequence, click on one LUN, hold down the <CTRL> key, then click on each additional LUN you wish to select.
   - **Disabled Selected LUNs**. All of the selected (highlighted) LUNs are disabled.
   - **Restore Original Configuration**. The device's LUN configuration when the application started is restored.
   - **Exit**. Closes the *LUN Configuration* window and returns to the QLconfig main window.

5.7 Uninstalling QLconfig

To uninstall QLconfig, you must first stop the QLconfig NT/2000 Security application.

5.7.1 Stopping the QLconfig Agent

To stop the QLconfig NT/2000 Security application, perform the following steps:

1. Select **Start>>Settings>>Control Panel>>Services**.
2. Go to the QLconfig NT Agent service and click **Stop**.

To stop the QLconfig NetWare Security application, type the following at the NetWare command prompt:

```
:UNLOAD QLCAGENT
:UNLOAD ONCSP
:UNLOAD NWCDMI
:UNLOAD NWDMI2
:UNLOAD NWSL
:UNLOAD TIRPC
:UNLOAD LOCAL_ND
:UNLOAD SPX_ND
:UNLOAD TCP_ND
:UNLOAD SPXS
:UNLOAD IPXS
:UNLOAD RPCBSTUB
:UNLOAD NETDIR
```

5.7.2
Uninstalling the Application

To uninstall QLconfig, follow these steps:

1. Stop the QLconfig Security application (NT/2000 or NetWare) services (see section 5.7.1).
2. The DMI 2.0 Service Provider provides its own uninstall option. Stop the win32sl service before running the uninstall process.

   This process uninstalls the local copy of the QLconfig application and QLconfig Security application. The uninstall program will also attempt to uninstall the NetWare Agent if it is installed. The drive mapped to the \SYSTEM folder of the NetWare SYS Volume when QLconfig was installed must be available for the uninstall program to properly uninstall the NetWare agent.
3. Select **Start>>Programs>>QLogic Management Suite>> QLconfig>>unInstall**.
4. Follow the on-screen instructions to remove the installed components.

Appendix A
Frequently Asked Questions

Table A-1 lists some Frequently Asked Questions (FAQs) about the QLogic Management Suite (QMS).

Table A-1. Frequently Asked Questions

Question	Answer
What is the relationship between QMS and RAID software?	QMS and RAID software are complementary parts of SAN software. QMS deals with the adapter board (QLA2xxx); RAID deals with drives. The failover capabilities of QMS are separate and complementary to the failover capabilities of RAID.
With which QLogic adapter boards does QMS work?	QMS supports the entire QLogic family of Fibre Channel boards (see section 2.4). Future QLogic Fibre Channel products will also be supported. QMS does not support SCSI products or Fibre Channel products from other manufacturers.
What CPU architectures does QMS support?	QMS supports both simple (single processor) and complex (two-way and four-way) processors.
Do I need QMS for my QLA2xxx adapter board to work?	No. In a Windows NT/Windows 2000 system, the QLA2xxx adapters require only a miniport driver for basic functionality. The optional QLdirect adjunct driver provides higher performance and failover capability. The optional QL2200IP driver adds IP protocol capability. The QLconfig, QLview, and QLconfig IP utilities provide setup and management of the drivers and boards. In a NetWare server, the QLA2xxx adapters require a Host Adapter Module (HAM) driver for the QLA2xxx adapter and a Custom Device Module (CDM) driver for each type of storage device attached to the QLA2xxx adapter.
What is DMI?	DMI stands for Desktop Management Interface, a standardized management framework created by the Desktop Management Task Force (DMTF).
How can I tell if DMI is installed in my system?	In a Windows NT/Windows 2000 system, execute the “Services” applet in the Control Panel and look for the service called “Win32sl”.

Table A-1. Frequently Asked Questions (Continued)

Question	Answer
What is an RPC type?	RPC stands for Remote Procedure Call, a programming technique that provides the ability to call procedures outside of an application's current address space. In QMS, Distributed Computing Environment (DCE) is the RPC type used for Windows NT/Windows 2000 and Open Network Computing (ONC) is used for Novell NetWare.
What is a transport type and which one should I use?	Transport type is the network protocol used by RPC. Examples of transport types are TCP and UDP Internet protocols. Use the one that is installed on your system.
I try to set up a connection to a machine but it fails. What should I do?	Check the following items: ❑ The QLview/QLconfig agent is installed and started on the remote machine. ❑ The network connection between the local and remote machine is functioning (use a network tool such as PING to check the connection). ❑ The correct RPC type is selected. ❑ The correct transport type is selected. ❑ For QLconfig, the correct password is provided.
Where can I get the DMI error codes?	From the Intel DMI 2.0 Software Development Kit (SDK), which was provided by Intel originally and now is supported by Smart Technology Enablers (http://www.enablers.com).
The QLogic icon in the system tray is flashing; what happened?	There are active alarms from the adapters that need to be acknowledged.
What is a loop map and why I do not always get a full list?	A loop map shows the physical connection of an arbitrated loop. It is not valid in a fabric environment.
What is link status and what does it tell me?	Link status is a list of the Fibre Channel loop port's error counts from the Read Link Status (RLS) extended link service. It gives the Fibre Channel link diagnostic of the port.
What is the difference between a loopback test and a read/write buffer test?	A loopback test is a diagnostic tool that is internal to the QLogic QLA2xxx adapter's firmware. A read/write buffer test consists of SCSI commands sent to a SCSI or Fibre Channel target.
Which protocols are supported in NetWare?	TCP/IP and IPX/SPX are supported.
Why can't I connect to my Novell NetWare server with TCP/IP using my server name?	Due to a limitation of the DMI services for NetWare, the IP address must be used instead of the server name.

Appendix B
Glossary

This section describes common hardware, software, SCSI, and Fibre Channel terms that are used in the QMS documentation.

Adapter	An adapter is the board that interfaces between the host system and disk. Adapter is synonymous with *host adapter*, *adapter board*, and *Host Bus Adapter (HBA)*. In the QMS documentation, the term *QLA2xxx* adapter is used.
AL_PA	AL_PA stands for Arbitrated Loop_Physical Address. This is a low level address on the Fibre Channel loop.
Arbitrated loop	An arbitrated loop is a *non-point to point* circular topology where two or more ports can be interconnected, but only two ports can communicate at one time. All communication is *passed* through all ports connected onto the loop.
Cluster	A cluster is multiple servers linked together sharing all resources to deliver high-availability/high-performance computing.
CRC	CRC stands for Cyclic Redundancy Check. CRC is the error detection technique used by most communication protocols including Ethernet, Ultra DMA (UDMA), Fibre Distributed Data Interface (FDDI), and Fibre Channel. CRC is more powerful than simple parity checking.
DCE	DCE stands for Distributed Computing Environment, a remote procedure call developed by the Open Software Foundation (OSF).
DMI	DMI stands for Desktop Management Interface. DMI is the industry standard for asset tracking and system management from the Desktop Management Task Force (DMTF). At the time of publication, the DMI revision level is 2.0.

Driver

Driver refers to software that interfaces between the file system and a physical data storage device or network media.

The level structure for Windows NT/Windows 2000 drivers is as follows:

- *Class Driver.* This is the highest driver level. There is a separate class for disk, Ethernet, etc. This level handles all generic aspects of operations for that class.
- *Port Driver.* This is the middle driver level, which handles aspects of the operation specific to the port type; for example, there is a port driver for SCSI.
- *Miniport Driver.* This is the lowest driver level and device specific. This level is usually supplied by the manufacturer as a companion to a physical device.
- *Monolithic Driver.* This level combines the functions of different driver levels in the same driver to increase performance.
- A*djunct Driver.* This level works along side a driver at the same level to increase performance.

In NetWare, the required drivers include:

- *Host Adapter Module (HAM)*. HAM is the driver component associated with the host adapter hardware. It provides the functionality to route requests to the bus where a specified device is attached.
- *Custom Device Module (CDM)*. CDM is the drive component associated with storage devices. It provides the functionality to build device-specific commands from I/O messages received from NetWare's Media Manager.

Fabric

A fabric consists of cross-connected Fibre Channel devices and switches.

Fabric switch

A fabric switch connects multiple devices from independent Fibre Channel-Arbitrated Loops (FC-ALs) and point-to-point topologies into a fabric.

Failover path

The failover path software feature ensures data availability and system reliability by assigning alternate pathing and automatic adapter failover for device resources. This is a feature in the High Availability version of QLconfig.

GUI

GUI stands for Graphical User Interface. GUI is a style of system control based on pictures and diagrams instead of text commands.

IOCB	IOCB stands for I/O Control Block. An IOCB is a command structure in QLogic ISP architecture.
IP	IP stands for Internet Protocol, a method and convention for sending a single packet of data through a network, combined with Transmission Control Protocol (TCP), as the basis of most intranet and Internet communication. IP is the lower connectionless layer that transmits a single packet of data to an address that uniquely identifies the receiver. TCP is the upper connection-oriented layer that disassembles the message into packets on the sending end and reassembles the packets (in the correct order) on the receiving end. IP can be used on Fibre Channel to send messages around a network, assuming that the endpoints support IP.
IPX/SPX	IPX/SPX stands for Internetwork Packet eXchange/ Sequenced Packet eXchange. These are Netware communications protocols. IPX traffic does not travel on Fibre Channel.
LIP	LIP stands for Loop Initialization Process. LIP is the initialization process in an arbitrated loop that occurs when the loop is powered up or a new device is added. One function of a LIP is to assign addresses. All data transmission on the loop is suspended during a LIP.
Loopback	Loopback is a diagnostic tool where data is transmitted and received by the QLA2xxx adapter.
LUN	LUN stands for Logical Unit Number, the small integer handle that identifies a portion of disk storage. A LUN may consist of a single physical disk or many physical disks. A physical disk may be broken into multiple LUNs.
LUN masking	LUN masking is a software feature that assigns LUNs to specific servers or hides LUNs from specific servers for maximum access and availability control. This is a feature in QLconfig.
Media	Media are carriers of information. Fibre Channel supports several different physical media: copper, multimode optical, and single-mode optical, which differ mainly in the maximum cable length. All Fibre Channel protocols are supported on all media.

Node name — See WorldWide Name (WWN).

NVRAM — NVRAM stands for NonVolatile Random Access Memory. Small amounts of NVRAM save configuration parameters. Values are changed with a configuration utility and are retained when power is removed.

ONC — ONC stands for Open Network Computing, a remote procedure call developed by Sun Microsystems.

Path — A path to a device is a combination of a QLA2xxx adapter and a target port. Note that this is distinct from any internal paths within the fabric network. A fabric network appears to the operating system as an opaque network between the host bus adapter (initiator) and the target port.

Since a path is a combination of a host bus adapter and a target port, a path is distinct from another path if it accessed through a different host bus adapter, and/or it is accessing a different target port. Consequently, when switching from one path to another, the driver might be selecting a different QLA2xxx adapter (initiator), a different target port, or both. This will make a difference to the driver when selecting the proper method of failover notification. It can make a difference to the target device, which might have to take different actions when receiving retries of the request from another initiator or on a different port.

Point to point — Two Fibre Channel nodes directly connected (non-loop).

Port — Ports are access points in a device where a link attaches. There are four types of ports, as follows:

- ❑ *N_Port* is a Fibre Channel device port that supports point-to-point topology.
- ❑ *NL_Port* is a Fibre Channel device port that supports loop topology.
- ❑ *F_Port* is a port in a fabric where an N_Port may attach.
- ❑ *FL_Port* is a port in a fabric where an NL_Port may attach.

Port name — A port name is the unique name of a port on a Fibre Channel device. A WorldWide Name (WWN) may have several port names associated with it (one port name for each port).

Protocol — A protocol is a convention for data transmission that defines timing, control, format, and data representation. SCSI, IP, and VI are protocols.

QMS — QMS stands for QLogic Management Suite.

RAID	RAID stands for Redundant Array of Independent Disks, which is a set of methods for storing data on multiple disks. Striping increases logical capacity. Mirroring increases performance and reliability. Various parity schemes increase reliability. RAID schemes can be implemented in hardware or software.
RPC	RPC stands for Remote Procedure Call.
SAN	SAN stands for Storage Area Network, which consists of multiple storage units and servers connected by networking topology.
SCSI	SCSI stands for Small Computer System Interface. The original SCSI specification was a hardware bus specification and a packet-oriented protocol specification for communicating on that bus. SCSI over Fibre Channel uses the packet-oriented protocol to communicate with storage devices on the Fibre Channel.
SP	SP stands for Service Provider.
SPX	See IPX.
Static load balancing	Static load balancing is a software feature that improves system performance by balancing device access between multiple QLA2xxx adapters for maximum resource efficiency. This is a feature in QLconfig.
Target device	A target device is a storage device that is uniquely identified by a WorldWide Name (WWN) and offers block disk storage for one or more LUNs through one or more target ports.
Target port	A target port is a Fibre Channel target that is uniquely identified by a worldwide port name and provides an access into the target device. As long as a device has only one port, the worldwide port name can be the worldwide node name, but it is not necessary. Many manufacturers make the worldwide node name and the worldwide port names similar to each other (the same number with a couple of bits changed), but it is not necessary.
TCP	TCP stands for Transmission Control Protocol, a network transport layered combined with IP.

UDP	UDP stands for User Datagram Protocol, a network transport layered on IP.
WWN	WWN stands for WorldWide Name and is also known as the node name. A WWN uniquely identifies a Fibre Channel device. The different ports on a Fibre Channel device will have the same node name but different port names.

Appendix C
Contacting QLogic

For product information, our latest drivers, and links for technical assistance, please visit QLogic's web site at: http://www.qlogic.com.

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